THE FARMERS' REGISTER.

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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

For the Farmers' Register.

SOME ACCOUNT OF THE AGRICULTURAL SOIL AND PRODUCTS OF MIDDLE FLORIDA, IN A LETTER TO THE EDITOR.

Sir:

Agreeably to the wish which you have intimated, I proceed to give you a sketch, though a hasty and imperfect one, of the agriculture, soil, and products of Middle Florida.

The Floridas were ceded by Spain to the United States by the treaty negotiated at Washington, in 1819, but it was not until the summer of 1821, that our flag waved in peaceful possession over the fortresses of Augustine, Pensacola, and St. Marks. Soon after this latter event, numbers of our people, with their characteristic enterprise, prepared to settle in the newly acquired territory, and about the year 1825, the resources of Middle Florida began to be developed. Up to the period of our acquisition of the Floridas, little was known of their internal condition, their soil, climate, &c., and the most contradictory opinions were entertained. But when Middle Florida had been penetrated and explored, and a country found possessing a large portion of fertile lands, with a beautifully undulating surface, and a climate, as it was fondly hoped,

"Where the flowers ever blossom, the beams ever shine;"

the most favorable impressions were made upon the public mind; the expectations of many were wrought up to an inordinate degree, and they indulged the belief that they would be able to unite there the various products of the temperate and torrid zones. Besides cotton, sugar cane, &c., many hastened to plant the orange, not doubting that, in due time, they would be gratified by the fragrance of its bloom, and the luxury of its fruit. But, in the full tide of experiment, "there came a frost, a killing frost." The memorable frost of the 6th of April, 1828, and those of the two succeeding winters, have demonstrated to the unwilling inhabitants of the interior of Middle Florida, that, with them, the orange cannot be produced in the open air. On the sea-coast and islands, however, no doubt can be entertained of the practicability of producing it, because it is produced in East Florida, in the same latitude, and on the sea-islands of Georgia, in a higher latitude.

With respect to sugar cane, the disappointments have been less signal and decisive, but the losses far greater. Its production and manufacture is an expensive process, and where any thing like a crop is attempted, a failure is attended with serious consequences. The failures which have been experienced here in this crop have resulted mainly from want of knowledge, and want of adequate preparations for "taking off the crop," that is, for grinding and boiling the cane. In common with Louisiana, however, much loss has resulted from the severe frosts of the last three winters. From my own experience, and from my observations in Louisiana and in Florida, I believe that in no part of the United States is the sugar cane so good a crop as cotton; *Quæque ipse miserrima vidi, et quorum pars fui.* In the lower part of Louisiana, however, and in East Florida, that culture may be advantageously pursued, because there the climate is most favorable for cane, and the soil not so suitable for cotton. The high price of sugar which now prevails, and which is likely to continue, is an additional incentive to its production in those parts of the United States, which favor it most.

So much has, of late years, been written and published in the United States concerning the culture of the sugar cane, that I shall be brief in what I have to say on this subject.

Two sorts or species are cultivated in Florida, the Otaheite or Green Cane, and the Ribband Cane. The former attains the largest growth; the latter is a more hardy plant, and, therefore, better adapted to the vicissitudes of our climate. The mode of planting is in drills, from four to five feet apart; the cane laid horizontally in the trench or drill, two or three together, in order to insure a good stand. The time of planting may be at any time between the first of November and the first of April, when the temperature of the weather does not approach the freezing point, at which times the cane must not be taken from its beds, and exposed to the air. After it has come up, it is ploughed and hoed like cotton or Indian corn. About the middle of October, the grinding and boiling should be begun, as the lower part of the canes is then fit for sugar, and the tops for planting. But it is usual also to reserve a portion of the entire canes for planting. When the approach of frost is feared, the standing cane is cut off at the surface of the ground, and laid in large flat beds, or *mattresses*, in which situation, if the operation be properly performed, it is secure from the effects of frost. After this the grinding may be continued, and I have known sugar made from cane that had lain in mattresses for forty, fifty, and sixty days.

From the roots of the cane left in the earth, a second crop is obtained, which is called the "Rattoon crop," which ripens earlier and more perfectly than the crop from the plantings. It is desirable, therefore, to have one half the crop of each year from rattoons, in order that by mixing them, in boiling, the greater maturity of the one may compensate, in a degree, for the deficiency of the other. After severe winters, however, the rattoon crop has been found to fail to a greater or less extent. In this climate the rattoons can only be relied on for one year, and, without them, it requires from twenty to twenty-five per cent. of the whole crop to renew it. It is obvious that this alone, is a severe tax upon the sugar planter.

The cultivation of cotton which, at first, was but a secondary object with most of the settlers in Florida, has become the principal pursuit of the planters.

Three sorts or species of cotton are planted in Middle Florida. First, the common green-seed cotton, (*Gossypium herbaceum*) originally from India, and the Levant. Second, the Mexican cotton, (*Gossypium hirsutum?*) Third, the sea-

island cotton (*Gossypium Barbadense?*) which is a native of some of the West India Islands. The two former are *short staples*, the last is the *long staple* cotton. The modes of cultivating and ginning the latter differs from that of the two former, which is so well known in all the southern states.

The sea-island cotton being a plant of larger growth, requires more space than the two other species. On good soils it is not unusual to see it ten feet high. It is usual to make the beds or ridges larger, and to hoe it more carefully than the other sorts; but it may be doubted whether there is any essential difference in the plants, in this respect. It requires a longer season to mature its fruit than the others. The difference is probably about four weeks.

The short staple cottons are prepared for market with *saw-gins*, which do their work with great despatch. On the contrary, it is necessary to prepare the sea-island cotton with *roller-gins*, in order to avoid breaking the staple, and thus destroying that *length of fibre* which gives it its superiority over the other sorts of cotton. Of the roller-gins, there are several sorts, differing in the mode of construction, as the foot-gin, the horse-gin, &c., but all of which are slow in operation when compared with the saw-gin. Again, the product of this cotton, to the acre, is not so great as the other. But to compensate for these disadvantages, the price of it, when prepared for market, is usually about double the price of short staple cotton. On some of the sea-islands of South Carolina, a variety of the long staple cotton is produced (by a few planters)which is much finer than that which is ordinarily cultivated, and which commands about double the price of the latter, and quadruple the price of short staple cotton. The knowledge of it was for a long time a secret, confined to a few; but the seeds are now freely sold in the Charleston market, at from two to five dollars a bushel. At times when the prices of cottons have been high, this fine variety has commanded a dollar per pound, and the discoverer of it was offered, by a neighboring planter, $50,000 for the secret!

As yet, however, the Mexican cotton is that which is most commonly cultivated in Middle Florida, but the soil and climate having been proved to be well adapted to the production of sea-island cotton, it is probable that, as the plantations are opened, and the pressure of out-door labor during winter becomes less, the proportion of this cotton will be increased.

The average product of this species of cotton may be stated at about six hundred pounds to the acre, though it is not unusual to obtain as much as eight hundred pounds. Its yield from the seed, is as one to three, while that of short staple cotton is a little more than one to four. During the past season, some planters of Mexican cotton have obtained seven, eight, and even nine bags to the hand, but the average is probably not more than four or five.

Cotton in this climate begins to bloom during the first week in June, and the picking may be commenced early in August. Sea-island cotton should be planted between the 10th of March and the 1st of April. Short staple cotton may be planted at any time from the 10th of March to the middle of May. The sea-island cotton is used for the finest cotton fabrics, and the finest sewing cotton, and it is said to be used in France for adulterating their silks.

Spanish tobacco has been cultivated in Florida, and found to do well. Segars have been made of it which have all the perfume of good Havana segars. It is said to be a profitable crop.

The olive tree (*Olea Europæa*) has been tried, and found not to succeed. Col. John Gamble imported a number of trees from Marseilles, and planted them on his estate. He informs me that they have perished *to the roots* by frost, every winter since he planted them. And yet in the garden of my friend Dr. Wray, of Augusta, (Geo.) I have seen a young olive tree, which for several years, has borne the winters in the open air. Of the European olive, however, there are several varieties, and that which I saw in the garden of Dr. W. is not the one which is commonly cultivated, as it requires a much longer period to come to maturity. Like the orange tree, the olive would probably do well on the sea-coast and islands. I learn that the olive has been reared at Augustine, where oranges are also produced in abundance.

Indian corn does well, and the crop is easily made. It may be planted the first week in March, and the cultivation completed early in June. When the spring is favorable, it may be planted in February, and the cultivation completed in May.

Oats and rye do well, and ought to be extensively introduced to alternate with cotton and corn.

Wheat has been but little tried, and I am unable to say with what success.

In the soil of Florida there is great diversity. The reader, perhaps, has not to be told that a large portion of the country is occupied by *pine barrens*, as they are called. Even in these, there is great diversity, some being quite productive, while others are extremely barren. In the former, the pines (*pinus palustris*, the long leaf, pitch pine) grow large and tall, and are associated with the *Black Jack*, (*Quercus nigra*) in the latter they are stunted in growth, and are associated with the "barrens' scrub oak," (*Quercus Catesbæi*) which, in common language, is often confounded with the "Black Jack."

The richest uplands are the Hammocks or *Hummocks*, a word which probably has its root in the Latin *humidus*, moist, or *humeo* to be wet, indicating in this instance, not a wet or swampy soil, but its contiguity to some body of water, either a creek, river, or lake.* Intermediate between these are the *oaky lands*, which have a stiffer soil than the others, and by many are thought to excel the hammocks in the production of cotton. The frequency and suddenness with which these soils change from one to another, surprises every observer, and baffles every theory to account for it. Frequently after passing a dreary tract of pine-barrens, or barren sand-hills, you come, suddenly, on the borders of a hummock, which greets you like an oasis in a desert, contrasting with the former fertility of its soil, and the beauty of its numerous evergreens.†

* Or perhaps in allusion to the humidity of its atmosphere, as the branches of the trees and their dense foliage detain the evaporation, and keep up a degree of moisture very favorable to the growth of parasitics, as the Long Moss, Mistletoe, Epidendrum, &c.

† Pre-eminent among these stands the stately Mag-

Marl is not rare in Florida, and the whole country being based on a shell rock, it is, probably, abundant, and will, in due time, be developed. I have myself seen some very fine specimens.

Very respectfully, yours,

H. B. CROOM.

Lake Lafayette, near Tallahassee, March, 1834.

P. S. With respect to fruits, I may state, that peaches do very well, though they are sometimes destroyed by the spring frosts. Apples, pears, cherries, &c. have not been sufficiently tried. The number of wild plums in this country, is remarkable. A species of gooseberry (Ribes rotundifolium of Michaux?) grows wild in the hammocks, and from the quantity of subalpine growth, it might be inferred that this country would prove favorable to the production of most of the fruits of temperate climates. But the fact remains to be tested. Strawberries grow as large and as fine as I have seen them in any country. They are now ripening abundantly. (March 31st.)

Some corn which I planted about the 20th of February last, came up in due time, has been ploughed and hoed once, and is now thrifty and promising. It is probable that two crops of corn might be made in one season, if it were desirable to do so. But late corn in this climate is apt to be attacked by worms, while in roasting ear.

THE WILD ONION.

To the Editor of the Farmers' Register.

Cambridge, Md. April 18, 1834.

Will you allow me through the medium of the Farmers' Register, to make the inquiry of your numerous correspondents, whether there is any effectual mode, and what it is, of extirpating that most destructive of all weeds, the wild onion?

I purchased several years ago, a farm near Cambridge, of poor clay soil, filled with starveling onions. I had always been impressed with the idea, that heavy manuring would eradicate them, by the substitution of other vigorous vegetation; but experience teaches me the error of that opinion. I have made the land extremely rich, yet the onions have increased in number, and in vigor of growth, *pari passu* with the improvement; and now at this moment, my wheat field exhibits the mortifying spectacle of a serious and doubtful conflict, between these best and worst of the vegetable creation; and I fear the onions will bear the palm.

An answer to my inquiry will confer an obligation on,

Yours, very truly. J. E. M.

P. S. Has an effectual onion riddle ever been invented?—by whom?—and, where may it be obtained? J. E. M.

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nolia Grandiflora, accompanied by its relative the fragrant Magnolia Auriculata, the Olea Americana, Hopea tinctoria, Ilex Opaca, Prunus Caroliniana, &c. Here too, are the Red-bud and the Beech, the elegant Stuartia, the showy Hydrangea, and the gay Azalea. These are often entwined about their trunks by these elegant creepers, the Carolina Jessamine, the Coral Honeysuckle, the Decumaria Sarmentosa, the luxuriant Cissus, and the splendid Bignonias, while the Tillandsia Resneoides festoons their branches! Such is a Florida hammock—the pride of Flora, and the paradise of botanists.

A BREEDING MULE.

To the Editor of the Farmers' Register.

Spring Hill, Nansemond county, 2d May, 1834.

A circumstance has occurred on my plantation, which seems to be against the general principles of nature. On the 23rd of April, 1834, a female mule of mine, had a colt, never suspected by me until I saw its birth. I had worked her hard all last year, upon the farm, and on the rail road, through the winter hauling marl, and all the month of March hauling logs, from a distance of two miles, six loads a day, and thirty logs each load, making twenty-four miles each day. She was at work all April hauling out manure, until the 23d. On that day I had gone, a little time before night, from the labors of the day, owing to one of my family being sick; and about 5 o'clock in the evening, the boy that drove the mule, came running to the house, saying that Jenny (for that was her name) had a colt. I went out and in a few minutes thereafter, the *thing* (for I know not what to call it) was delivered, and is now doing well. I never suspected the mother's being with foal, because I thought it contrary to nature, though I had for four or six weeks observed that her belly was enlarged, and so much so, that the cart had to be altered, as it rubbed her. She showed no other sign—so I did not suspect it. She has little or no bag, though I believe she gives a plenty of suck, as her *child* is now getting fat. At first it was very poor. Now you will ask what is the father of it? I cannot say—but believe, a colt of mine, now three years old. He ran out on Sundays, with the mules, and the black boy tells me that there was cause for such an effect. So it is, the mule has a colt, and it is exactly like the young stallion. If this is a matter of curiosity, you may give publicity to it, under my name. Hundreds can prove the fact—and several can testify that they were present at the birth.

JOHN THOMPSON KILBY.

P. S. The mother certainly is *a mule*, for she was foaled mine, and is now ten years old.

[The fact stated by Mr. Kilby is particularly interesting, because so authenticated as to leave not the slightest ground for doubt. But though it is contrary to the general operation of a law of nature, for any mule or hybrid animal to be capable of procreation, it is well known to naturalists that there have been some (though rare) exceptions to the rule. Whether in these cases the offspring is barren, according to the general and wise provision of nature, to prevent the continuance of mongrel breeds, or not, has not yet been determined].

YELLOW (OR WILD) LOCUST.

The Genesee Farmer of April 5th, says that "yellow locust seed is worth $4 or $5 the pound—say $1 the half pint. And trees of suitable size for setting may be had at several nurseries in Western New York at $6 per hundred." At these prices, it would be a profitable employment of labor to gather the ripe pods of the wild locust, where they are produced abundantly, as on the high calcareous banks of the lower James River.

For the Farmers' Register.

FECUNDITY OF A EWE.

I think it was on the 25th of January, 1833, that the only ewe with black wool in my flock, (and which, therefore, could not be mistaken for any other,) had a lamb. On the 20th of April, following, that lamb was killed, and eaten. On the 25th of the same month and year, (the ewe running upon a good clover field) the same ewe took the ram—(a broad-tail, since, unfortunately, dead.) On the 16th of July, the same ewe had a lamb, as I was first informed by one of my family, (the sheep being then grazing in a lot around the house,) and I went out and found it so. That lamb was not killed, and is still living. From the 16th to the 20th of September, in the same clover field, the ewe again took the ram; and during one of those snows, either in January or February, last past, the boy that attends the sheep says, that one morning upon going to the fodder stacks, where the sheep were kept, he found that this same ewe had lost a lamb—making two births and a miscarriage in twelve or thirteen months. Probably the miscarriage was occasioned by some hurt the ewe might have received.

How long do ewes go with lamb? I have believed about four months and twenty days; if so were not her births premature? I ask for information.

OBSERVER.

10*th April*, 1834.

BARKING TREES.

From Goodsell's Genesee Farmer.

It often happens that fruit trees, more particularly apple and pear trees, are stripped of their bark during the winter by sheep, rabbits, or mice. When such accidents do happen, such trees should not be looked upon as lost, but as soon as the sap begins to circulate freely in the spring, they should be repaired, by fitting in pieces, on every side, to keep up the circulation, between the top, and the roots.

The following directions, will enable those who shall be so unfortunate as to have any of their trees injured by mice, or otherwise, to repair them without incurring any great expense.

Where the bark has been taken from the bottom of a tree, as soon as it is discovered, it should be covered up to prevent the wood from becoming dry. During the month of May, uncover the wood, and with a chisel, or some other instrument, cut off from the tree, so much wood as will leave a flat surface, equal in width, to the piece to be inserted. Let this extend so far up and down as to reach the sound bark, and make the cut square in at the ends. Procure a piece of wood from a growing tree of the same kind, whether apple or pear, cut it of a suitable length, split off a piece from one side of it, cut the ends smooth with a knife, being careful not to bruise the bark, fit it closely into the place prepared in the side of the tree, having the greatest proportion of the sap flow, or line between the bark and wood, that can be, come in contact. Proceed in the same way on different sides of the tree, after which bind the whole part with some bark, or strings made from flax, and cover the whole with earth, if it does not extend too far up the tree. If the bark was removed too far up, to be convenient for covering with earth, take some strips of cotton cloth, dip them in melted grafting wax, and wind them on in such a manner as to make the whole air tight. If well done the pieces will unite at both ends, and soon extend so as to cover the wound.

WOOD SNAPPING ON THE FIRE.

From the Genesee Farmer.

I believe we have no wood in this country that is more worthless for fuel than the Butternut. A few *cuts* of this kind, however, about ten inches in diameter, had been split in two, left some weeks to dry, and then carried into my chamber. On placing one stick on the fire, it began to snap most remarkably: sometimes there were not less than fifteen or twenty sparks on the carpet at once; and the inconvenience was serious. What was to be done? I happened to recollect a paragraph in your second volume, taken from some eastern paper, stating that *wood snaps on the fire from the side nearest to the heart.* It was so in this case. I just turned the log over, and at once the difficulty was at an end; for though it continued to snap for some time against the back plate, yet no more sparks came into the room.

When I put on the next log, I was particular to turn the heart backwards, and I have had no trouble from snapping since. Now the knowledge of this thing is but a trifle indeed, but it may be worth knowing, for I have often seen the guests round a parlor fire starting up to put out the sparks, when I presume nothing more was wanting than to turn over a stick.

A FARMER.

LIVE HEDGES.

Extracts from the New England Farmer.

"For the last twenty years I have paid great attention to this subject, and will give you the result of my experience. The first hedge I set out (about 500 feet in length) was of the English hawthorn or quickset. The result was decidedly unfavorable. The plant is not adapted to this climate—it appears better suited to the moist atmosphere of England; our long summer drought injures it; it is peculiarly subject to the attacks of the borer; a species of mildew or blight almost invariably assails it early in August, by which it loses its leaves, and by the middle of August or first of September assumes a wintry appearance.

"My next experiment was with the three thorned acacia, recommended by Judge Buel. The hedge was not more than fifty feet in length, but was placed in excellent soil and carefully attended. I had supposed that the long thorns with which the plant is armed, would have made it peculiarly efficacious as a fence. The result was even more unfortunate than before. Prune and clip it as I would, I could never make it grow thick; it appears to have a decided tendency to shoot upwards rather than to spread; the thorns grow only upon or near the upper branches, and below there was nothing but the bare stems to serve as a fence. It would often, too, lose as much during a hard winter, as it had grown during a whole summer. After a trial of near ten years I dug up the whole and replaced it with the American buckthorn, (Rhamnus catharticus.) With this I have been completely successful. It has, it is true, but few thorns, but it grows naturally so thick as to be a complete protection to the land enclosed by it. It shoots early in the spring, and holds its verdure till very late in the fall. If properly managed, it

is so close below that a rabbit could scarcely work its way through; while above, the strong branches are so wattled and interlaced, that a man could not scale it, nor a bull force his way through it.

"I have now in different places at least half a mile of this hedge, which I shall be very happy to show to any of your correspondents who may wish to see it.

"The mode of cultivation is very simple—it is set out either in the fall or spring in the manner recommended by Judge Buel; if in the fall, it is clipped the next spring within about nine inches of the ground. Next spring it is clipped again at the height of about two feet, the third spring at about three feet from the ground, with some side pruning. The next summer your hedge is complete, and you may keep it at the height and thickness desired at the expense of a little pruning.

"I have also tried plashing. In 1818 or 19, my gardener, who was an Englishman, highly recommended it, and at last persuaded me to let him attempt it upon a young and thrifty hedge made of crab apple. He did it as it appeared to me, very skilfully, but it was a very long and tedious operation, and the result was the hedge was ruined. His mode of operating (which is I believe the common one) was to suffer the main stem to remain upright, while all the side ones were partially cut and bent down nearly horizontally, and so confined either by interlacing or by staking them down; they did not thrive however—they perished by degrees, and I was at last forced to prune away all the horizontal branches, and lost at least four year's growth.

"With the buckthorn I have never found plashing to be in any degree necessary or useful. If managed in the way I have described, in three years the hedge will be complete, requiring afterwards very little care, and nearly as thick, and quite as impervious below as above."

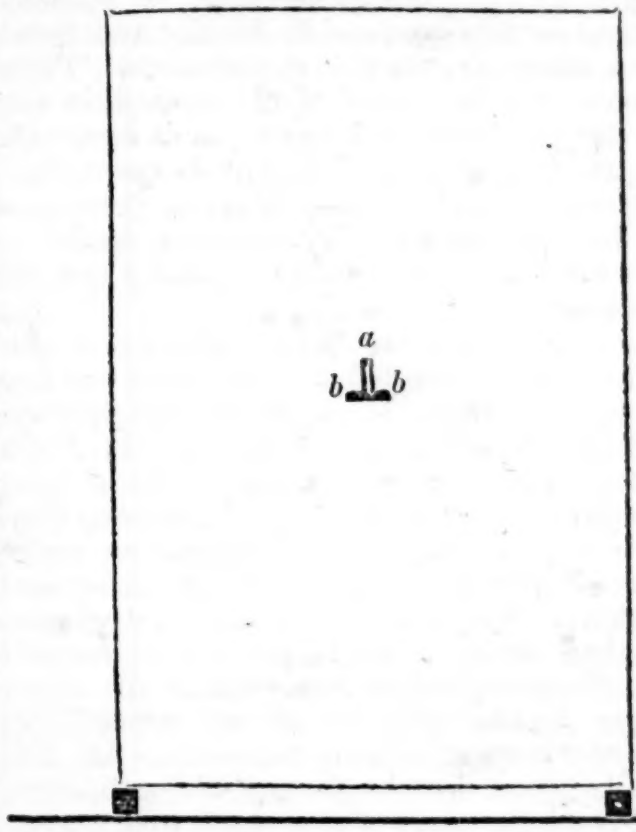
"Buckthorns should be set in a single row, from seven to nine inches apart; as soon as they begin to vegetate, they should be headed down to about six inches from the ground, which will cause the hedge to become thick from the bottom. By keeping the ground clean, and occasionally shortening the stray shoots, it will soon make a beautiful and efficient fence. It is an extremely vigorous, free growing plant, and in our opinion superior to any plant we are acquainted with in this country, for making a hedge."

A WORD IN SEASON, OR AN EFFECTUAL SECURITY AGAINST THE BEE MOTH.

For the Farmers' Register.

As soon as your bees commence working in the spring, examine your hives, and with a slab of wood, or piece of hoop iron, scrape the stand immediately under the hive, also around the inner edges of the box, taking care to remove all the web that may be attached to any part of the stand or hive, as the whole secret consists in keeping them free from the web formed by the moth or fly. Having completed this operation, provide yourself with four square blocks of wood, and place one under each corner of your hive, so as to raise it not quite half an inch from the stand; this will enable you to clean the stand without removing the hive. This scraping operation must be repeated every three or four days, if there should be any appearance of web forming on the stand, or around the inner edges of the hive. It seems necessary to remark, that the moth or fly, makes its attacks by a kind of regular approach, first forming its web on the stand, and then extending it up the sides of the hive until it gets complete possession. By a little attention in cleaning the stand and hive, as directed, you will certainly secure your bees from the ravages of the worm. In the winter, the blocks must be removed from under the hive, so as to allow it to rest immediately on the stand, which will secure it against the attacks of mice, &c. On this plan, it is advisable to make an entrance for the bees, by cutting a perpendicular slit in the front part of the hive, half way from the bottom, say two and a half inches in length, and one-eighth of an inch wide, with a kind of shelf just under it to serve as a resting place for the bees going and returning to the hive. After being a little used to it, the bees seem to prefer this entrance to the one at the bottom of the hive. This plan has proved an effectual security against the worm, after every other remedy has failed; and not a single hive has been lost since it was adopted.

Z.



(*a*) Entrance, one-eighth of an inch wide, and two and a half inches long.
(*bb*) Shelf below the entrance.

MATERIALS FOR MANURE.

Extract from an article by J. H. Couper, in the Southern Agriculturist.

A sufficient amount of manure is yielded to keep the soil in the most productive state, if a stock of animals be kept on the plantation, and the dry vegetable matter of the fields be carefully carted to the pens. The expressed cane, tops and leaves, from an acre of cane, yield about 10,000 lbs. of dry vegetable matter. An acre of corn, including blades, stalks, shucks and cobs, about 2500 lbs., when the yield of corn has been 20 bushels: and the after crop of peas 1000 lbs., together 4500 lbs. An acre of solid peas 2000 lbs. The potatoe vines, pumpkins and turnips, being eat green, contribute only to the production of fluid manure. The total quantity of dry vegetable matter to be

applied to the manuring of 16 acres in crop, will therefore be,

4 acres in corn, at 4500 lbs. per acre,		18,000 lbs.
1	" peas and turnips,	2,000
3	" cane, at 10,000 lbs.	30,000
		50,000

which, if merely rotted by rain, will yield 100,000 lbs. of manure; and if rotted by the urine and dung of stock, from 150,000 lbs to 200,000 lbs., or at least 25,000 lbs. of manure to each of the 4 acres proposed to be manured. To this supply of manure, must be added from 50 to 70 bushels of cotton-seed, from seven acres of cotton, to be applied to the four acres of corn; and the peas that are ploughed in, preparatory to the potatoe crop of vines.

MATERIALS FOR CORDAGE.

For the Farmers' Register.

Dr. Perrine, American Consul at one of the Mexican ports, has asked of Congress a grant of land in the peninsula of Florida, for the purpose of introducing and cultivating the *Agave Americana*, (the famous centennial Aloe) which he recommends as a material for cordage. It is indeed much used for that purpose in Mexico and South America, where its growth is spontaneous. There is no doubt that this plant would do well in any part of the peninsula of Florida, for it bears the winters at Charleston, S. C. and at Augusta, Geo. If, however, its cultivation is likely to prove profitable, I see no reason why congress should be asked to *give* lands for the purpose; and if not, we had then better let it alone.

If any additional material for cordage is requisite or desirable in this country, we have one in a native plant, probably not inferior, for that purpose, to the Agave Americana. I allude to the *Yucca filamentosa*, which grows spontaneously in light sandy soils, (and often on the very poorest) from Virginia to Florida, and is commonly known under the name of *Bear grass*, and sometimes under that of *Silk grass*. The fibres of this plant are remarkable for their strength, and I have seen ropes made of it, equal in strength and appearance to any other. To obtain the fibres, the leaves are "rotted" in water, or by burying them in the earth. Mr. Elliott, in his "Sketch of the Botany of South Carolina and Georgia," says of this plant, that "it appears to possess the strongest fibres of any vegetable whatever; and, if it can be raised with facility, may form a valuable article in domestic economy." The *root* is also a substitute for soap in washing woollens.

Of the facility of its production, I entertain no doubt. No plant is more hardy, or bears transplanting better. Its roots are extensive, having numerous *eyes*, or buds, and each one of these will produce a plant. There are millions of acres in the southern states unfit for the ordinary purposes of agriculture, which would produce this plant very well.

H. B. C.

A FLOOD OF THE MISSISSIPPI.

Many of our larger streams, such as the Mississippi, the Ohio, the Illinois, the Arkansas, and the Red River, exhibit, at certain seasons, the most extensive overflowings of their waters, to which the name of *floods* is more appropriate than the term *freshets*, usually applied to the sudden risings of small streams. If we consider the vast extent of country through which an inland navigation is afforded by the never-failing supply of water furnished by these wonderful rivers, we cannot suppose them exceeded in magnitude by any other in the known world. It will easily be imagined what a wonderful spectacle must present itself to the eye of the traveller, who, for the first time, views the enormous mass of waters collected from the vast central regions of our continent, booming along, turbid and swollen to overflowing, in the broad channels of the Mississippi and Ohio, the latter of which has a course of more than a thousand miles, and the former of several thousands.

To give you some idea of a *booming flood* of these gigantic streams, it is necessary to state the causes which give rise to it. These are the sudden melting of the snows on the mountains, and heavy rains continued for several weeks. When it happens that, during a severe winter, the Alleghany mountains have been covered with snow to the depth of several feet, and the accumulated mass has remained unmelted for a length of time, the materials of a flood are thus prepared. It now and then happens that the winter is hurried off by a sudden increase of temperature, when the accumulated snows melt away simultaneously over the whole country, and the south easterly wind which then usually blows, brings along with it a continued fall of heavy rain, which mingling with the dissolving snow, deluges the alluvial portions of the western country, filling up the rivulets, ravines, creeks, and small rivers. These delivering their waters to the great streams, cause the latter not merely to rise to a surprising height, but to overflow their banks, wherever the land is low.—On such occasions, the Ohio itself presents a splendid, and at the same time, an appalling spectacle; but when its waters mingle with those of the Mississippi, then kind reader, it is the time to view an American flood in all its astonishing magnificence.

At the foot of the falls of the Ohio, the water has been known to rise upwards of sixty feet above its lowest level. The river at this point, has already run a course of nearly seven hundred miles from its origin at Pittsburgh, in Pennsylvania, during which it has received the waters of its numberless tributaries, and overflowing all the bottom lands or vallies, has swept along the fences and dwellings, which have been unable to resist its violence. I could relate hundreds of incidents which might prove to you the dreadful effects of such an inundation, and which have been witnessed by thousands besides myself. I have known, for example, of a cow swimming through a window elevated at least seven hundred feet from the ground, and sixty-two above low water mark. The house was then surrounded with water from the Ohio, which runs in front of it, while the neighboring country was overflowed; yet the family did not remove from it, but remained in its upper portion, having previously taken off the sashes of the lower windows, and opened the doors. But let us return to the Mississippi.

There the overflow is astonishing; for no sooner has the water reached the upper part of the banks, than it rushes out and overspreads the whole of the neighboring swamps, presenting an ocean overgrown with stupendous forest trees. So sudden is the calamity, that every individual, whether man or beast, has to exert his utmost ingenuity to ena-

ble him to escape from the dreaded element. The Indian quickly removes to the hills of the interior, the cattle and game swim to the different stripes of land that remain uncovered in the midst of the flood, or attempt to force their way through the waters until they perish with fatigue.

Along the banks of the river the inhabitants have rafts ready made, on which they remove themselves, their cattle, and their provisions, and which they then fasten with ropes, or grape vines, to the larger trees, while they contemplate the melancholy spectacle presented by the current, as it carries off their houses and wood yards piece by piece. Some who have nothing to lose, and are usually known by the name of *squatters*, take this opportunity of traversing the woods in canoes, for the purpose of procuring game, and particularly the skins of animals, such as the deer and bear, which may be converted into money. They resort to the low ridges, surrounded by the waters, and destroy thousands of deer, merely for their skins, leaving the flesh to putrify.

The river itself, rolling its swollen waters along, presents a spectable of the most imposing nature. Although no large vessel, unless propelled by steam, can now make its way against the current, it is seen covered by boats laden with produce, which running out from all the smaller streams, float silently towards the city of New Orleans, their owners, meanwhile, not very well assured of finding a landing place even there. The water is covered with yellow foam and pumice, the latter having floated from the rocky mountains of the north-west. The eddies are larger and more powerful than ever. Here and there tracts of forests are observed undermined, the trees gradually giving way, and falling into the stream. Cattle, horses, bears and deer, are seen at times attempting to swim across the impetuous mass of foaming and boiling water; whilst here and there a vulture or an eagle is observed perched on a bloated carcass, tearing it up in pieces, as regardless of the flood as on former occasions, it would have been of the numerous *sawyers* and *planters* with which the surface of the river is covered when the water is low. Even the steamer is frequently distressed. The numberless trees and logs that float along, break its paddles and retard its progress. Besides, it is on such occasions difficult to procure fuel to maintain its fires; and it is only at very distant intervals that a wood-yard can be found which the water has not carried off.

Following the river in your canoe, you reach those parts of the shores that are protected against the overflowing of the waters, and are called *levees*. There you find the whole population of the district at work, repairing and augmenting those artificial barriers which are several feet above the level of the fields. Every person appears to dred the opening of the *crevasse*, by which the waters may rush into his fields. In spite of all exertions, however, the *crevasse* opens, the water bursts impetuously over the plantations, and lays waste the crops which so lately were blooming in all the luxuriance of spring. It opens up a new channel, which, for aught I know to the contrary, may carry its waters even to the Mexican Gulf.

I have floated on the Mississippi and Ohio, when thus swollen, and have, in different places, visited the submersed lands of the interior, propelling a light canoe by the aid of a paddle. In this manner I have traversed immense portions of the country, overflowed by the waters of these rivers; and, particularly whilst floating over the Mississippi bottom-lands, I have been struck with awe at the sight. Little or no current is met with, unless the canoe passes over the bed of a bayou. All is silent and melancholy, unless when the mournful bleating of the hemmed-in deer reaches your ear, or the dismal scream of an eagle or raven is heard, as the foul bird rises, disturbed by your approach, from the carcass on which it was allaying its craven appetite. Bears, cougars, lynxes, and all other quadrupeds that can ascend the trees, are observed crouched among their top branches. Hungry in the midst of abundance, although they see floating around them, the animals on which they usually prey, they dare not venture to swim to them. Fatigued by the exertions which they have made in reaching the dry land, they will there stand the hunter's fire, as if to die by a ball were better than to perish amidst the waste of waters. On occasions like this, all these animals are shot by hundreds.

Opposite the city of Natches, which stands on a bluff bank of considerable elevation, the extent of inundated land is immense, the greater portion of the tract lying between the Mississippi and the Red River, which is more than thirty miles in breadth, being under water. The mail-bag has often been carried through the immersed forests, in a canoe, for even a greater distance, in order to be forwarded to Natchitochez.

But now, kind reader, observe this great flood gradually subsiding, and again see the mighty changes which it has affected. The waters have now been carried into the distant ocean. The earth is every where covered by a deposite of muddy foam, which, in drying, splits into deep and narrow chasms, presenting a reticulated appearance, and from which, as the weather becomes warmer, disagreeable, and at times noxious exhalations arise, and fill the lower stratum of the atmosphere, as with a dense fog. The banks of the river have almost every where been broken down in a greater or less degree. Large streams are now found to exist, where none were formerly to be seen, having forced their way in direct lines from the upper parts of the bends. These are, by the navigator called *short-cuts*. Some of them have proved large enough to produce a change in the navigation of the Mississippi. If I mistake not, one of these, known by the name of *Grand Cut-off*, and only a few miles in length, has diverted the river from its natural course, and has shortened it by fifty miles. The upper parts of the islands present a bulwark, consisting of an enormous mass of floated trees of all kinds, which have lodged there. Large sand banks have been completely removed by the impetuous whirls of the waters, and have been deposited in other places. Some appear quite new to the eye of the navigator, who has to mark their situation and bearings in his log-book. The trees on the margins of the banks, have in many parts given way. They are seen bending over the stream, like the grounded arms of an overwhelmed army of giants. Every where are heard the lamentations of the farmer and planter, whilst their servants and themselves are busily employed in repairing the damages occasioned by the floods. At one *crevasse*, an old ship or two, dismantled for the purpose, are

sunk, to obstruct the passage opened by the still rushing waters, while new earth is brought to fill up the chasms. The squatter is seen shouldering his rifle, and making his way through the morass, in search of his lost stock, to drive the survivors home, and save the skins of the drowned. New fences have every where to be formed; even new houses must be erected; to save which from a like disaster, the settler places them on an elevated platform, supported by pillars made of the trunks of trees. The lands must be ploughed anew, and if the season is not too far advanced, a crop of corn and potatoes may yet be raised. But the rich prospects of the planter are blasted. The traveller is impeded in his journey, the creeks and smaller streams having broken up their banks in a degree proportionate in their size. A bank of sand, which seems firm and secure, suddenly gives way beneath the traveller's horse, and the next moment the animal has sunk in the quick-sand, either to the chest in front, or over the crupper behind, leaving its master in a situation not to be envied.

Unlike the mountain torrents and small rivers of other parts of the world, the Mississippi rises but slowly during these floods, continuing for several weeks, to increase at the rate of about an inch in the day. When at its height, it undergoes little fluctuation for some days, and after this subsides as slowly as it rose. The usual duration of a flood is from four to six weeks, although, on some occasions, it is protracted to two months.

Every one knows how largely the idea of floods and cataclysms enters into the speculations of the geologist. If the streamlets of the European continent afford illustrations of the formation of strata, how much more must the Mississippi, with its ever-shifting sand banks, its crumbling shores, its enormous masses of brift timber, the source of future beds of coal, its extensive and varied alluvial deposits, and its mighty mass of waters rolling sullenly along, like the flood of eternity.

DISEASES OF HOGS.

From the Genesee Farmer.

MR. L. TUCKER—I am engaged in milling, and have kept a stock of about three hundred hogs in a large frame pen, divided into twenty-four rooms, with plank floor, and lodging rooms covered and boarded, leaving open only sufficient room for them to enter. They have been fed on bran, shorts, and cross middlings. I have lost, during the last winter, about fifty—many of them were fat, and would weigh two hundred when dressed.

They were taken with weakness in the back, and lose the use of their hind parts—generally live from two to three weeks. On opening them, have always found a great many slim worms about an inch long in the leaf and about the back bone. I have tried all medicine recommended by farmers in this section, and in no instance had a cure.

I have a neighbor, who purchased a drove last fall, and has given them seven hundred dollars worth of corn, and the stock now left are not worth the first cost in consequence of the same disease.

You or your correspondents will confer a favor by giving me such information as you or they possess, respecting a remedy.

Yours, respectfully, R. H. H.

Venice, Huron co., (Ohio,) April 2, 1834.

ODDS AND ENDS.

To the Editor of the Farmers' Register.

Brunswick, March 31, 1834.

I shall be glad to learn from some of the readers of the Farmers' Register, what I have been trying for thirty years in vain to find, a good and sure method to destroy lice on hogs, cows, and horses. A decoction of tobacco will kill the lice, but will not destroy the nits. I have frequently sheared hogs for this purpose, and it is the best means to rid them of lice: but shearing a hog is a tedious job, which no one will be anxious to repeat.

What is the best remedy for worms in horses?

By what means can house flies be destroyed, or rendered less numerous and troublesome?

What safeguard can be used against the worm which cuts off young corn at the first joint in low grounds? I am sometimes compelled to plant mine three or four times, before I can get it to stand.

What will prevent the ravages of the fly which eats tobacco plants? Mine have been often almost entirely destroyed by these insects. But I am now mostly a cotton planter—though the *rot* and low prices together, have made me almost heartless.

When I plant tobacco in lots where I can plough it well, I throw up beds of thirty-nine inches wide, with a two-horse plough, and stick the plants about twenty inches apart, on the middle of each bed. I never prime (or take off the lower leaves) when I top the plants: but when they are hilled up, some of the small leaves are taken off—such as probably were on the young plant when first set out. Planting from the 1st to the 10th of June, is preferred to any other time. I generally top high, if the season and the land will permit—and if I can get the top leaves to *make*, (or mature) it is all I want. The cold dews, late in the growing season, help tobacco very much. I am much in favor of packing tobacco loose in the hogshead, (or without tying the leaves in bundles,) because, if it is manufactured in this country, it takes much trouble to untie the six-leaf bundles, and then the tie-leaf is worth but very little. It seems strange to me that any one should approve of these small bundles.

I planted a small kind of speckled pea in the same piece of land for three or four years. Those made the last year that I planted them, were *coal black*, and as late as any other pea. To what can this remarkable change be ascribed? J. K.

AGE OF SHEEP.

From the Mountain Shepherd's Manual.

The age of a sheep may be known by examining the front teeth. They are eight in number, and appear during the first year, all of a small size. In the second year, the two middle ones fall out, and their place is supplied by two new teeth, which are easily distinguished by being of a larger size. In the third year, two other small teeth, one from each side, drop out and are replaced by two large ones; so that there are now four large teeth in the middle, and two pointed ones on each side. In the fourth year the large teeth are six in number, and only two small ones remain, one at each end of the range. In the fifth year the remaining small teeth are lost, and the whole front teeth are large. In the sixth year the whole begin to be worn; and in the seventh, sometimes sooner, some fall out or are broken.

To the Editor of the Farmers' Register.

EXHAUSTING AND IMPROVING CULTIVATION.

Powhatan, April 13th, 1834.

I have, for some time, desired that some one would undertake to correct the evils prevailing in our county, to the devastation and entire destruction of the value of our lands, by hard and excessive culture, and which ought to have opened the eyes of more gentlemen who are really practical farmers, well-informed, and influential in many laudable things, but who appear to me, to have yielded without a struggle to this ruinous system of management. By pursuing this course, detrimental to their own interest and diminishing the wealth of our beloved commonwealth, they have already caused, and will continue to produce that abandonment of their native state and emigration to the west, which has been forced upon our people by their increasing necessities. That this diminution in the value of our lands is too much owing to neglect and bad management, and that an improved plan of cultivation will, with but little additional industry, effect a very great and desirable change in the present gloomy appearance of our lands, must, I think, be evident to all who bestow even a slight degree of attention on this important subject. To reclaim our exhausted lands, is not so impracticable as it has been considered: but it requires the dissemination of information acquired by experience, and the free interchange of opinion on agricultural subjects. The work in which you have engaged, is a proper channel for the communication of this mutual instruction, which I look upon as a safeguard of our happiness, and a harbinger of our future prosperity: and I consider it the duty of each subscriber to the 'Register,' to contribute all in his power to the general stock of information. Under a sense of this duty, and not with a vain expectation of imparting any material benefit to my brother farmers, I have been induced to address you; and I have been the more encouraged to do so, from having already observed the good which has resulted from the communications of some of your earlier correspondents.

Having for eight or ten years past, been in the habit of partially grazing my land, and having found, as I supposed, an improvement therefrom, I took up an idea that by pursuing this course, with the addition of all my manure, (a scanty portion however,) I could restore my farm to its original productiveness. But the period within which I had hoped to effect this desirable change passed away, and instead of improving, I had impoverished my land. I determined, therefore, to resort to clover; and in 1831 I sowed a lot of about twenty-four acres with twenty gallons of clover seed. Upon about one-third of this lot, immediately after sowing, I scattered the chaff of three crops of wheat, which had a very happy effect: for although the whole of the seed took tolerably well, it came up much thicker upon this portion of the lot, and would have produced more than twice the quantity, by weight, had it been cut and tried. The clover here lodged. It should be mentioned however, that the land on this part of the lot was better than the rest. In April, twelve months after the clover was sown, I had plastered it with one ton of plaster to the whole. This clover was turned under last August, (1833) with double ploughs, breaking the land to the depth of six or eight inches. I then, with a couple of large two-horse drags, harrowed the land the same way it was broken up, which smoothed the surface, although the weather was very dry. On the 27th of September, following, I commenced sowing upon this lot about twenty-five bushels of wheat, harrowing it the same way that the land was ploughed, and lapping about half the width of the harrows, by which means the land was gone over twice, the lapped part finishing the work as it went on; the hoe hands followed, chopped over, cleared out the water-furrows, and grips, and broke up all the clods. The prospect for a crop is, at this time, very promising, and I shall not be much mistaken in my calculation when I say that the product will be more than seventy-five per cent. greater than I have ever made from the same land. I am confident that I have added to the fertility of this land more in two years than could have been done in six, in the way I at first attempted its improvement; and that by some similar course of culture, land may be so highly improved, that a crop of small-grain will lodge upon it, and render the cultivation of other crops necessary to reduce its exuberant fertility.

Having abandoned the three-shift system altogether, and pursuing now a different mode of cultivation, I may hereafter give you the results of my experience, when I have acquired more than I now possess. In the mean time, it may be not uninteresting, to give you some account of the present state of my little farm. It consists of about two hundred and thirty acres, divided by a fence running nearly through the middle of the plantation. On one side of this fence is the fresh land, being the smallest portion, and containing about one hundred acres, which is already sown in wheat and clover; (the clover up tolerably well:) on the opposite side are one hundred and thirty acres of land, much more lean. Each of these divisions will be subdivided by turning-rows, so as to make two fields of fifty acres on one side, and two of sixty-five on the other side of the fence. It is not my intention, however, to commence with corn upon any one of my fields until the year 1836: in the meantime the division of one hundred and thirty acres is to be fallowed in the course of this summer, and laid down in wheat this fall; and in the spring ensuing the whole of this part will be sown in clover. I have no standing pasture, but use a tract of rented land for grazing; and should be pleased to learn what kind of grass would be most profitable, and prosper best, if sown in the woods for a standing pasture, the undergrowth being first cleared up, the brush cleaned off, and the leaves raked up and hauled away.

The production of my farm in small grain, has been moderately increasing for several years, by its having been a little more nursed than some others. I have for some time been in the habit of top-dressing. I have top-dressed clover one year old with wheat straw, put on in the fall. This plan is well adapted to produce a vigorous growth of clover in the ensuing spring. I have also used ashes on the surface, at the rate of one bushel to thirty feet square, well spread, upon wheat and clover, then covered with litter from the stable; consisting principally of wheat straw, thrown out every morning into a pen, and allowed to go through a fermentation. This I think the best top-dressing I have ever tried.

I have top-dressed land too poor to bring a crop

of any kind, with leaves from the wood, mixed with wheat straw, which I think answers well, if fallowed afterwards for wheat. The most abundant manure we have is that from the farm pen, the top-dressing with which should be done in a careful manner; great regularity should be maintained in spreading it to prevent the tender plants from being stifled: other advantages also will result from this care: the manure will cover a greater surface, and the land will be regularly benefited, whereas, if it is carelessly spread, the crop will be uneven, unseemly to the eye, and much less productive.

I am now trying an experiment in the cultivation of new-ground corn, which I had heard of some time ago, as well as more recently. The land is not cleared of the leaves, trash, sticks, &c., which are not too much in the way of the plough or coulter; and after the operation of the coulter, the ground is hilled up five and a half feet apart one way, and two and a half the other, chopping down the hills low, opening holes at the same time, into which four or five grains of corn in a hill are dropped. The crop is cultivated with coulters first, and then with bar-share ploughs, and should be laid by just before harvest. Once hilling will be sufficient, and that when the corn is about twelve inches high; taking care to chop out the bushes after harvest. A preparation of this kind is exactly calculated to add to the natural fertility of the land, and must, I think, be the best plan to preserve the productiveness of the maiden soil: it saves, besides, the labor of hauling off the litter, unless it is intended, by collecting and burning it, that the first blow in the destruction of the soil should be struck by the hand of the owner, instead of his adding to his land whatever may repay him for his labor in its cultivation.

It is insisted that the next crop after the corn should be tobacco, by which the planter may avoid the labor of hauling off or burning the leaves, and may, at the same time, improve his new land. But upon estimating the profit and loss upon the cultivation of tobacco for a century past, (not half the time from its commencement,) I am disposed to think the planter a loser to no little amount. It is owing, in my opinion, to that crop principally, that the face of our country presents so melancholy an aspect. Take a glance at the states to the north of us, and see if it requires a Solomon to judge the difference of the two countries. Theirs is a grain and grass growing country, and quadruples ours in the product of small grain to the acre: here, to the unsuccessful culture of grain and grass, we add a tobacco crop, the worst of all others to impart any benefit to the soil on which it grows. The labor in cultivating tobacco, can scarcely, at any time, be intermitted longer than three days; and all other crops whatever, except in time of harvest, (and I have seen thousands of plants topped in harvest,) must wait for the tobacco; and after it is made, it frequently remains upon hand for twelve months or longer, because the price it can command, will not more than half repay the cost of the labor bestowed upon it; and when at length it is sold, not one hogshead in a thousand, perhaps, commands ten dollars. The remainder is sold at from three to five dollars per cwt. and during the numerous operations requisite in its cultivation and preparation for market, gulleys are forming and increasing; and the fences are neglected and abandoned to destruction: whereas, if our lands were cultivated in grain and clover, with other valuable grasses, they would present a very different aspect, with much more valuable returns.

In some instances, however, a farmer might make a small crop of tobacco with advantage. If he owned only a small tract of land, and too many hands to find employment in the cultivation of a crop of small grain, and was unwilling to hire out any part of his negroes, he might, by resorting to a tobacco crop, keep them profitably employed for a few years. S. B.

ORIGIN AND USE OF TOBACCO.

From the London Penny Magazine.

Tobacco was introduced into Europe from the province of Tabaca in St. Domingo, in 1559, by a Spanish gentleman, named Hernandez de Toledo, who brought a small quantity into Spain and Portugal. From thence, by the means of the French ambassador at Lisbon, Jean Nicot, from whom it derived its name of Nicotia, it found its way to Paris, where it was used in the form of a powder by Catherine de Medici. Tobacco then came under the patronage of the Cardinal Santa Croce, the pope's nuncio, who, returning from his embassy at the Spanish and Portuguese courts, carried the plant to his own country, and thus acquired a fame little inferior to that which, at another period, he had won by piously bringing a portion of the *real* cross from the Holy Land. Both in France and in the Papal States it was at once received with general enthusiasm, in the shape of snuff; but it was some time after the use of tobacco as snuff, that the practice of smoking it commenced. This practice is generally supposed to have been introduced into England by Sir Walter Raleigh; but Camden says, in his 'Elizabeth,' that Sir Francis Drake and his companions, on their return from Virginia 1585, were "the first, as far as he knew, who introduced the Indian plant, called Tabacca or Nicotia, into England, having been taught by the Indians to use it as a remedy against indigestion. And from the time of their return," says he, "it immediately began to grow into very general use, and to bear a high price; a great many persons, some from luxury, and others for their health, being wont to draw in the strong-smelling smoke with insatiable greediness through an earthenware tube, and then to puff it forth again through their nostrils; so that tabacca-taverns, (tabernæ tabaccanæ) are now as generally kept in all our towns, as wine-houses or beer-houses." No doubt the tobacco-taverns of Queen Elizabeth's times were not unworthy predecessors of the splendid cigar divans of the present day. It appears from a note in the 'Criminal Trials,' vol. i. p. 361, that in 1600, the French ambassador, in his despatches, represented the Peers, on the trial of the Earls of Essex and Southampton, as smoking tobacco copiously while they deliberated on their verdict. Sir Walter Raleigh, too, was accused of having sat with his pipe at the window of the armoury, while he looked on at the execution of Essex in the Tower. Both these stories are probably untrue, but the mere relation of them by contemporaneous writers shows that they were not then monstrously incredible, and they therefore prove the generality of the practice of

smoking at that time amongst the higher class of society. After a time, however, the practice of smoking tobacco appears to have met with strenuous opposition in high places, both in this country and other parts of Europe. Its principal opponents were the priests, the physicians, and the sovereign princes; by the former its use was declared sinful; and, in 1684, Pope Urban VIII. published a bull, excommunicating all persons found guilty of taking snuff when in church. This bull was renewed in 1690, by Pope Innocent; and, about twenty-nine years afterwards, the Sultan Amurath IV. made smoking a capital offence. For a long time smoking was forbidden in Russia, under pain of having the nose cut off; and in some parts of Switzerland, it was likewise made a subject of public prosecution—the police regulations of the Canton of Berne, in 1661, placing the prohibition of smoking in the list of the Ten Commandments, immediately under that against adultery. Nay, that British Solomon, James I., did not think it beneath the royal dignity to take up his pen upon the subject. He accordingly, in 1603, published his famous 'Counterblaste to Tobacco,' in which the following remarkable passage occurs:—"It is a custom loathesome to the eye, hateful to the nose, harmfull to the braine, dangerous to the lungs, and in the black stinking fume thereof nearest resembling the horrible Stygian smoke of the pit that is bottomless." But notwithstanding this regal and priestly wrath, the use of the plant extended itself far and wide; and tobacco is at this moment, perhaps the most general luxury in existence. The allusion to the practice in the following lines, taken from the 'Marrow of Compliment,' written in 1654, seems to show the prevalence of smoking at that period:—

"Much meat doth Gluttony procure
To feed men fat as swine;
But he's a frugal man indeed,
That on a *leaf* can dine!

He needs no napkin for his hands,
His fingers' ends to wipe,
That hath his kitchen in a box,
His roast meat in a Pipe!"

[Before meeting with the foregoing article, we had marked several passages from old authors on this subject, which will make a suitable addition.

King James in his *Counterblaste* says tobacco "makes a kitchen, also, often in the inward parts of men, soyling and infecting them with an unctious and oily kind of soote, as hath been found in some great tobacco takers, that after their death were opened:" and in his *Witty Apothegms*, after observing that "a tobacco pipe is a lively image of hell," the royal author specifies the things which he most abhorred, by saying that "were I to invite the devil to dinner, he should have three dishes—1st a pig; 2d a pole of ling, and mustard; and 3d a pipe of tobacco for digesture."

Old Burton in his Anatomy of Melancholy, says of tobacco—"a good vomit I confesse; a vertuous herbe, if it be well qualified, opportunely taken, and medicinally used; but as it is commonly used by most men, which take it as tinkers do ale, 'tis a plague, a mischiefe, a violent purger of goods, lands, health; hellish, develish, damned tobacco; the ruin and overthrow of body and soule."—*Anatomy of Melancholy.*

The following account of tobacco is from the Latin-English Dictionary of Francis Holy-oke. The copy before us was printed in 1659, the last year of the life of Oliver Cromwell; but as it is the seventh edition, it is probable that the whole of this account of "Tabacco" is much older than the book itself, and was probably copied without alteration from the first, through every successive edition of the dictionary.

"*Tabacco herba ab insula Tabaco, &c.* A kind of herbe called Tabacco, it is like henbane, and may be called the Indian henbane, hot and dry in the third degree (as I take it.) The juyce of the greene leafe is good to cure any greene wound, though it be poysoned, the syrup is good for divers diseases, the smoake of the leafe dryed and taken in a pipe, is used as in old time Tussilage was, for the cure of the Tissike, the cough of the lungs, distillations of Rheumes, cold, toothach, headach, and in fine whatsoever disease commeth of a cold and moyst cause, and good for all full bodies, that are cold and moyst of constitution, if it be moderately used, and taken upon an empty stomacke, and that it be good Indian, and not sophisticated, Immoderatly taken, it dryeth the body, inflameth the blood, burteth [burneth?] the braine and intoxicateth, breedeth wind and crudity, and hath a bewitching facultie that when men use it overmuch they cannot leave it. See Weekerus and others; now of the syrupe of Tabacco they make a vomit."]

From the Library of Useful Knowledge.

AGE OF THE HORSE.

The method of judging the age of a horse is by examining the teeth, which amount to forty when complete; namely, six nippers, or incisors, as they are sometimes called, two tushes, and six grinders on each side, in both jaws. A foal, when first born, has in each jaw the first and second grinders developed; in about a week the two centre nippers make their appearance, and within a month a third grinder. Between the sixth and ninth month the whole of the nippers appear, completing the *colt's mouth.* At the completion of the first year, a fourth grinder appears, and a fifth by the end of the second year. At this period a new process commences, the front or first grinder giving way, which is succeeded by a larger and permanent tooth, and between two years and a half and three years the two middle nippers are displaced, and succeeded by permanent teeth. At three years old the sixth grinder has either made, or is about making its appearance. In the fourth year another pair of nippers and the second pair of grinders are shed; and the corner nippers, toward the end of the fifth year, are succeeded by permanent teeth, when the mouth is considered almost perfect, and the colt or filly becomes a horse or a mare. What is called the *mark* of the teeth by which a judgment of the age of a horse for several years may be formed, consists of a portion of the enamel bending over and forming a little pit in the surface of the nipper, the inside and bottom of which becomes blackened by the food. This soon begins to wear down, and the *mark* becomes shorter and wider, and fainter. By the end of the first year the mark in the two middle teeth is wide and faint, and becomes still wider and fainter till the end of the third year, by which time the centre nippers have been displaced by

the permanent teeth, which are larger than the others, though not yet so high, and the mark is long, narrow, deep, and black. At four years the second pair of permanent nippers will be up, the mark of which will be deep, while that of the first pair will be somewhat fainter, and that of the corner pair nearly effaced. At this age, too, the tushes begin to appear. Between the fourth and fifth year, the corner nippers have been shed, and the new teeth come quite up, showing the long deep irregular mark; the other nippers bearing evident tokens of increasing wearing. At six years the mark on the centre nippers is worn out, but there is still a brown hue in the centre of the tooth. At seven years the mark will be worn from the four centre nippers, and will have completely disappeared at eight years from them all. It may be added, that it is the lower jaw of the horse that is usually examined, and which is here described. The changes of the teeth taking place in both jaws about the same time, but the cavity of the teeth in the upper jaw being somewhat deeper, the mark lasts longer, though the exact period is a matter of controversy. According to what may be considered good authority, however, it may be stated that at nine years the mark will be worn from the middle nippers, from the next pair at ten, and from all the upper nippers at eleven. During all this time the tushes (the extremities of which are at first sharp-pointed and curved) become gradually blunter, shorter, and rounder.

THE CHANGE OF VOLCANIC PRODUCTS TO FERTILE SOIL.

[The slow but certain change of lava and other products of volcanoes to fertile soil, has long been known as a remarkable and general operation of nature. The length of time required for this process is as various as are the proportions of the materials acted on; and even the shortest periods have generally been too long to be recorded by authentic history. The neighborhood of Siena, in Italy, still remains as barren and desolate as if the volcanic covering of the earth was of recent formation: yet it is known that the eruption that produced it took place more than three thousand years ago. To this, a remarkable contrast is presented in the following account of the island of Ascension, on which, the fertilizing effects of natural causes have rapidly worked to convert a naked and desolate rock, to a fertile habitation for man.]

From Morrell's Voyages.

The island of Ascension was formerly described as "a barren uninhabited island in the South Atlantic Ocean, without soil or vegetation," and as "an impracticable heap of volcanic ashes." This description was once correct; but industry, skill, and perseverance have now rendered a more favorable one appropriate. The island is in fact a shattered volcano, the pulverized materials of which, are rapidly becoming converted into a rich and fertile soil. It formerly belonged to the Portuguese, who discovered it in 1501; but in 1816, some English families from the island of St. Helena settled here, and it was taken possession of by the British government as a military station; and sixty transport ships provided the garrison of two hundred men with supplies from the Cape of Good Hope. A fort was erected, roads constructed, gardens planted, houses built, &c.

This island is of triangular shape, about twenty miles in circumference; being eight miles from north to south, and five miles and a half from east to west. It may be seen from the mast-head in clear weather at the distance of ten leagues, its appearance is uneven and rugged, being an assemblage of hills, with a mountain overlooking them from the south. This is called Green Mountain, and is about eight hundred yards in height. The best anchorage at this island is in Turtle Cove, in eight or ten fathoms of water, with the flag-staff on Cross-Hill bearing south-east-half-east; Rat Corner, south-south-west. Distance from the nearest shore about one mile. A heavy surf often interrupts the landing for several days together.

The whole island is of volcanic origin, and the surface is now partly covered with a reddish soil, while in some places there is a yellow earth resembling ochre. A fine black earth covers the bottom of the valleys, which are now in a fine state of cultivation by the little military colony before alluded to. The island is composed of several conic hills, from two hundred and fifty to three hundred and fifty yards in height. Green Mountain has a double top, rising in two peaks, like the Grecian Parnassus. In almost every part of the island, as Mr. Purdy justly observes, are found prodigious quantities of rocks full of holes like a honey-comb; together with calcined stones, very light, and pumice-stones. "The rocks, lying upon each other in a very irregular way, and mostly on the declivity of hills, leave great chasms between them; and as they have very little solidity, an observer runs some risk who ventures without caution upon them." About the middle of the island, and between the hills, there are several little plains, which are divided into small spaces, so remarkably distributed that you would take them for so many pieces of land cleared of stones, and separated from each other by long walls.

According to the statement of the officers of the English brig Slaney, who visited this island in February, 1827, Ascension was then (under the government of Lieutenant Colonel Nicholls) in a most flourishing state of progressive improvement as to its resources, both natural and artificial. Roads are constructing from the several springs (sixteen in number) to convey water to the garrison; and hopes were entertained of being able to supply a squadron with that essential article in the course of a year, by means of iron pipes from the principal spring to a reservoir near the beach. Pasturage for cattle is making its appearance. Sheep, turkeys, guinea-fowls, and live-stock of every description thrive well. Fruit, such as pines, Indian gooseberries and plantains have been successfully cultivated. Potatoes, onions, carrots, pease, French beans, and almost every esculent vegetable have been produced upon the island; and thus from a desert cinder, nature has been courted successfully to yield most of her useful vegetable productions. Only two deaths from sickness have occurred at Ascension during the last two years (1825 and 1826;) and when we consider that gales of wind are unknown to have visited the anchorage there, the value of the island as a rendezvous and a depot for stores and provisions, for a squadron of observation, destined to

cruise either on the African or Brazilian coast hereafter, will obviously repay the liberal attention that has been bestowed upon it."

A short time after the visit of the brig Slaney, the William Harris, a transport, landed at the island a cargo of live-stock, horses, hares, rabbits, pheasants, poultry, partridges, &c., seeds of vegetables, agricultural implements, and a supply of necessaries for the garrison, who all enjoyed very good health. In return, she took a large quantity of fine turtle, with which the island abounds; and according to Capt. Leslie, it furnishes the finest in creation," being "not only fat and large, but in the highest perfection for eating. Their weight, in general, is from one to seven hundred pounds. They are of all I ever tasted, the fattest and the finest; all others I ever saw before bear no comparison with them."

FLOATING GARDENS OF CASHMERE.

From the London Penny Magazine.

The city of Cashmere, being the capital of the province of that name in Asia, is situated in the midst of numerous lakes, connected with each other, and with the River Vedusta, by canals, separated by narrow lines and insulated plots of ground. Upon these lakes are floating gardens, cut off generally from the body of the lake by a belt of reeds; the cultivation of which is not only very singular, but highly profitable, and worthy of imitation in many parts of Europe as a resource for raising food for man. The second number of the 'Journal of the Geographical Society' contains a notice of the Natural Productions and Agriculture of Cashmere, from which the following account is compiled:—

The city of Cashmere is subject to considerable inundations, which have become annually more frequent, through the neglect of the government in not checking the accumulation of weeds and mud, which diminish the depth, and consequently increase the surface of the lakes. This has suggested the expediency of a floating support by which vegetables are cultivated in safety, deriving as much moisture as is beneficial without the risk of being destroyed. Various aquatic plants spring from the bottom of the lakes, as water lilies, sedges, reeds, &c.; and as the boats which traverse those waters take generally the shortest lines they can pursue to their destination, the lakes are in some parts cut into avenues as it were, separated by beds of sedges and reeds. Here the farmer establishes his cucumber and melon floats, by cutting off the roots of the aquatic plants about two feet under water, so that they completely lose all connection with the bottom of the lake, but retain their situation in respect to each other. When thus detached from the soil, they are pressed into somewhat closer contact, and formed into long beds of about two yards breadth. The heads of the sedges, reeds, and other plants of the float, are next cut off and laid upon its surface, and covered with a thin coat of mud, which, at first interrupted in its descent, gradually sink into the mass of matted stalks. The bed floats, but is kept in its place by a stake of willow driven through it at each end, which admits of its rising and falling in accommodation to the rise and fall of the water. By means of a long pole thrust among the reeds at the bottom of the lake from the side of a boat, and turned round several times, a quantity of plants are torn off from the bottom, and carried in the boat to the platform, where the weeds are twisted into conical mounds about two feet in diameter at their base, and of the same height, terminating at the top in a hollow, which is filled with fresh soft mud, and sometimes wood ashes. The farmer has in preparation a number of cucumber and melon plants, raised under mats, and of these, when they have four leaves, he places three plants in the basin of every cone or mound, of which a double row runs along the edge of every bed at about two feet distance from each other. No further care is necessary except that of collecting the fruit, and the expense of preparing the platforms and cones is very trifling. Mr. Moorcroft traversed about fifty acres of these floating gardens of growing cucumbers and melons, and saw not above half a dozen unhealthy plants; and he says, he never saw in the cucumber and melon grounds, in the vicinity of populous cities in Europe or in Asia, so large an expanse of plant in a state of equal health or luxuriance of growth. The general depth of the floating beds is about two feet, and some of them are seven feet broad. The season lasts for three months and a half, beginning in June. From the first setting of the fruit to the time of pulling, seven or eight days are the ordinary period. Thirty full-sized fruit from each plant, or from ninety to a hundred from each cone, are the average crops. The seed of the melon is brought annually from Baltistan, and the first year yields fruit of from four to ten pounds each in weight; but if the seed be re-sown, the produce of the second year exceeds not from two to three pounds. Unless when eaten to great excess, the melon produces no disorders, and it is remarked that healthy people who live upon this fruit during the season, become very speedily fat; and the effect upon horses fed upon this fruit is reported to be the same. In the early part of the season, cucumbers of full size sell at the rate of about three for a piece of coin of the value of a halfpenny; but as the weather becomes hotter, and the plants get into full bearing, ten, fifteen, and even twenty are purchased for this price. It is calculated that every cone yields a money return of about eighteen-pence. Allowing six-pence for labour of every description, and including also the tax, the clear profit is a shilling for every two square yards. The yield of the melon is numerically less, but the return of profit is at least equal. No other vegetables are raised upon the spaces between the cones, although Mr. Moorcroft thinks that onions, cresses, and other useful vegetables might be raised upon them; and water-mint grows spontaneously upon the floats.

Cashmere, or Cassimere, is one of the northern provinces of India within the Ganges. It is surrounded by mountains, and from its beauty and fertility has been called the Paradise of the Indies. It contains upwards of 100,000 villages, is well stocked with cattle and game, and is said to be unmolested by beasts of prey. The people are ingenious, and resemble the Europeans in their persons, and the women are fair and tall. The famous Cashmere shawls derive their name from this country, though at present the supply that actually comes from it is comparatively small.

FARMING IN THE VALLEY OF VIRGINIA.

Report of the Trustees of the Agricultural Society of the Valley, for 1825.

From the Records of the Agr. Soc. of the Valley.

The Trustees of the Agricultural Society of the Valley, who were appointed a committee to view the farms offered, and award the premium "to him whom they supposed to be the best manager of a farm, and most deserving of reward—taking into consideration the force employed, the crops made, his rotation, his method of improving the land," &c. &c., respectfully report:

That in the month of June last, Mr. Robert Page, of the county of Frederick, announced himself as a competitor, and desired them "to view his farm and decide upon his claims." For this purpose they assembled at his house, with a determination to inspect minutely all that came properly under the object of their visit, that they thereby might be enabled to expose mismanagement, where it existed, and to render more conspicuous the proof of good husbandry and domestic economy, where they were visible. To perform their arduous duties, and to award justly the premium entrusted to their care, the committee was sensible required they should divest themselves of all "fear, favor, or affection." And they now confidently assert, that this they accomplished, and that their report is based upon their impartial and unbiassed judgment. It affords the committee peculiar pleasure to state, that in their opinion the competitors for the very desirable premium offered by the society, are governed by the most honorable and commendable feelings—a spirit of emulation so much wanting with farmers—a praiseworthy desire to excel in the noblest occupation. This their whole course, thus far, has manifested to the entire satisfaction of the committee.

In viewing Mr. Page's farm, your committee was first led to his corn-field, containing five and twenty acres, which they found in a beautiful state—exhibiting proofs of industry and attention which met their decided approbation. They next came to his crop of wheat; (then nearly fit for the sickle,) which they found such as would be called a safe and profitable one, that would in all probability yield from fifteen to twenty bushels per acre. It is but proper to notice that the committee were particularly struck with the clean state of this crop, the result of fine seed and a proper preparation of the ground. The committee passed from the cultivated to that part of Mr. Page's farm which is this year in grass. Around this part of his tract they found the fencing in bad order, and in the fields some symptoms of bad management, which the rest of his farm was unusually exempt from. They allude to the *sprouts* of various descriptions, and the *loose* stone, that occupied space they would rather have seen appropriated exclusively to grass.

Mr. Page's buildings, of *every description*, are neat and comfortable; his arrangements for the accommodation of his negroes, his stock, &c. are worthy of the highest commendation. The committee would have been pleased could they have presented to the society a statement of the force employed, the crops raised, the stock supported, &c. on Mr. Page's farm. The circumstance of his uniting the labor and product of several farms, will prevent him from gratifying the expressed wishes of the committee on that point.

In the month of August your committee were called upon to view the farm of Henry S. Turner, of Jefferson county, who then announced himself a competitor for the premium above mentioned. Of *his* management, the committee will be able to give a much fuller report, from the circumstance of his having presented to them a statement (certified as the rules of the society require,) of his whole system of farming. They would not be doing justice to Mr. Turner's very able and satisfactory memoir, did they attempt to change its phraseology, or fail to embody it in their report; they therefore present it to the society *verbatim*, with the fullest impression, that as it is a practical production, it will prove to the farmer one of high and lasting value.

Mr. Turner says, "Wheatland Farm contains almost 940 acres of land, all inclosed: 300 in wood. A portion of the arable land is divided and laid off into six fields of 90 acres each, which yield a regular rotation of crops in the following succession, to wit: wheat, corn, fallow, wheat, clover, fallow, or, corn, fallow, wheat, clover, fallow, wheat. It will thus appear that two of these fields are in wheat, and one in corn annually: consequently a moiety of the tillable land yields a grain crop each year, though no part is in corn oftener than once in six years, nor in wheat oftener than once in three years, and all the fields are in clover, in succession, two years and six months, it being my habit to sow clover in the month of February, (on a snow,) and never to break up fallow until August, when the field which had produced corn the previous year, and another (a clover field,) are ploughed to the average depth of seven or eight inches, with four barshare ploughs, three horses or mules in each—the quantity daily ploughed from six to seven acres, according to the state and condition of the ground. After the ploughing has been completed, these fields are harrowed in the direction of the furrow, with heavy square harrows, drawn by three horses or mules, then laid off crosswise, in lands of 18 feet, and sowed the first of October at the rate of from seven to eight pecks per acre, and carefully harrowed in, which is performed in seven or eight days with four harrows. It is of the greatest importance, and demands the most particular attention of the farmer to commit his seed to the earth at the *proper time*. Placed, as it were, between Scylla and Charybdis, he has to steer a skilful and a narrow course to avoid the dangers that await him; a few days too early, and his hopes are wrecked upon the ravages of the Hessian fly; a few days too late, and they are destroyed by the desolating influence of the winter frost. Experience and much observation has assured me that the beginning of October is the *proper time;* but to defer seeding thus late with safety, our land must possess great strength and vigor. I omit, therefore, no means of fertilizing it to the greatest possible degree, as I am well assured that there is no labor performed by the farmer so amply remunerated as that employed in the application of manure.

"My calculation is always on twenty bushels of wheat to the acre. This expectation is rarely disappointed—it more frequently happens that there is an excess; better cultivation would insure increased product. I am convinced our lands are

capable of yielding 30 bushels on an average. In the year 1819, I gathered from 55 acres 1743 bushels; from 90 acres 2400 bushels; and from 40 acres 680 bushels—the first and second being of the blue stem wheat, (the most prolific kind that I am acquainted with,) and the last Lawler, (or Snyder,) which, though less liable to the attacks of the Hessian fly than most other species, is by no means exempt, and is less productive than the blue stem by 20 or 25 per cent.

"About 1500 bushels of wheat is secured within two barracks, near my barn and stables, (each 60 by 20 feet,) for the purpose of furnishing provender and litter to the stock stationed here during winter; the remainder of the crop is stacked near the centre of the field intended for corn the ensuing year; and here are erected shelters and pens, where the farm stock are fed and profusely littered, during winter, in temporary ricks, and with alternate layers of wheat-straw and corn-stalks, with the blades, shucks and tops attached, for the purpose of providing an ample fund of manure, to be hauled out on the same field early in the spring.

"I deem it the most economical method to plough under the manure in a rough state, and let the process of decomposition go forward under the tegument laid over it by the plough, as by this means the very serious waste by evaporation is obviated, the corn crop is measurably benefited, and it is in a state of preparation to impart the highest degree of nutriment to the succeeding crops of wheat and clover.

"My corn field receives the same preliminary cultivation as do my wheat fields; it is then laid off and planted four feet each way; (by close planting say three or three and a half feet each way, in *strong land*, I am confident [the product] would be increased, as the number of plants would be astonishingly multiplied; but the use of the plough would be more difficult, and no price which the article usually commands in this region of country, would justify the expense of its cultivation with the hoe.) When about six inches high, it is harrowed with heavy harrows, the middle teeth being removed; the harrows are followed by hands provided with small light rakes, with four iron teeth, to uncover the corn and thin it, leaving two stalks in each intersection, after which it is ploughed over three times with the *double shovel*, and laid by at the commencement of harvest. This is an admirable instrument for cultivating corn; it operates superficially, so as not to disturb the manure turned under by the barshare plough, and will perform two-fifths within a given time more than the single shovel, with, I believe, no augmentation of labour—at all events, one mule is fully adequate to the task.

"I do not estimate my average crops of corn at above 30 to 35 bushels per acre, though in the year 1823 I made 50 bushels per acre on 90 acres. The season was propitious, and this corn was planted four feet by three, two stalks in the hill.

"My force consists of eight ordinary men, two fine active boys, one old man in the decline of life, and a blacksmith and a carpenter occasionally; twelve horses and mules, with the incidental increase of brood mares, and four yoke of powerful, well trained oxen. And here let me take occasion to testify in favor of this most frugal, useful and estimable beast, the ox, and to express the earnest and anxious hope that he may speedily be brought into more general use among us, and elevated in the estimation of farmers to the rank which *his* merit and *their* interest so justly entitle him to. With the exception of ploughing, harrowing and thrashing, the entire labor of my farm is performed by oxen; the magnitude of their service, and the various ways in which they are most useful, is incalculable, and incredible to those who unfortunately have no experience of them. They are generally *fat*, never *poor*, and are never grain fed, except during the most inclement weather in winter, when laborious service is exacted of them, and even then they require nothing better than a scanty allowance of the offal of the granaries. One important result of this is, (among many other advantages,) that my work horses are at rest nearly half the year, by means of which, the expense of feeding them is considerably curtailed, and their lives prolonged. But it is in the particular of hauling out manure in the spring season, (when the horse and mule teams are employed in breaking up the corn field,) and hauling stone for fencing at all seasons, that the instrumentality of the ox is most conspicuously valuable; and much of the same service may be done likewise in the fall. Previous to the adoption of the extended use of oxen on my farm, I was constrained to rely almost exclusively on plaster of Paris for improving the soil. I used it to the amount of twelve or fifteen tons a year, and bought it during the war even at the cost of 40 dollars per ton; its effects were sometimes truly miraculous, but at other times not visible at all. All this is now superseded, and for the last five years I have entirely omitted the use of plaster, as by means of my ox teams I am enabled to get out, in good time, in the spring, the manure which has accumulated during the winter. Let me, however, not be understood as recommending the disuse of plaster—this is far from my intention: I have had ample proof of its unquestionable efficacy, and as auxiliary to stable or barn-yard manure, appreciate it most highly. Last spring, with eight oxen and three men, I manured, highly, 120 acres, passing over the richer spots, and applying the manure only where it was wanted—the number of acres actually covered with manure, I estimate at not less than 80; an inconsiderable part consisted of unrotted straw. But upon the ox (valuable and important as his services certainly are to the concerns of agriculture,) panegyric must not be exhausted: of all animals subservient to agricultural labor, the mule stands preeminent. I have no terms adequate to bespeak his merit—none that could be employed, could exaggerate it; he is a long liver, a small consumer, a powerful, faithful, and enduring laborer. I speak with the confidence of more than thirty years experience of the relative qualities and capacities of the mule and the horse, when I pronounce the superiority of the former to the latter in *every respect*, and for *every purpose*, connected with the operations of husbandry. It is a great misfortune, and much to be lamented, that prejudices, absurd as they are unfounded, and greatly detrimental to the farming interest, should still be fostered against this much abused and despised, though most valuable animal, by thousands ignorant of his history and usefulness, in despite of the testimony of those who have tried and know him well.

"The number of mules I have at present on

my farm is 12, of different ages; this number I mean to increase to 16, when the horse will be banished, except for the saddle and riding carriages, and even in this exception, a concession is made by judgment in favor of fashion. Some of those I now have, have been 16 or 17 years, upon the farm, and I now value them at $200 each. With such impressions, I trust it will not be deemed impertinent that I avail myself of this occasion to recommend most earnestly to the society, to extend their sanction and patronage to the more general introduction of the mule, by suitable premiums, or such other provisions as their wisdom may approve; being convinced that there is no object more in accordance with the interest of agriculture and the furtherance of their patriotic design.

"I should have mentioned in the foregoing part of this brief and hasty memoir, that it is my custom to cut and stack in the fields as much of my corn as I am able to haul into the farm-pens during winter; by this means the mass of manure is greatly increased, and its quality improved, the stalk acting as an *absorbent* to arrest the fertilizing fluids which would otherwise in a great measure escape. The whole of my corn is shucked in the field on the stalk; besides other obvious advantages, by this method, there is an important saving in time—my corn is generally housed by the middle of November.

"Exclusive of the six fields above spoken of, I have another containing 70 acres, (a late purchase.) This has rested some years in clover, to resuscitate from the exhausted state in which I received it. It will now be equally divided, and each half alternately cultivated, two years in succession, in wheat and clover.

"I never employ hired labor for any purpose in aid of my farming operations, and with six cradles generally complete my harvest in twelve or fourteen days.

"The foregoing outline is deemed sufficient for the present purpose; should a more minute and comprehensive detail be thought interesting, I beg leave to refer to vol. 2, page 400, of the American Farmer. Some allowance, however, will be here claimed for typographical errors, and other seeming inconsistencies, all of which are susceptible of satisfactory explanation."

It may readily be supposed, that from the fact of the committee having *heard* much of Mr. Turner's extraordinary management, they were prepared to *see* much, and that if their expectations were in the smallest degree disappointed, they should not fail to express it to the society. Appearing at Wheatland with these feelings, they were not prepared to notice or give credit for little proofs of good management only, but sought for and required more prominent ones. They now feel it a duty to state, that their highest anticipations were most satisfactorily and fully realized, and that *they* were not able to discover a *solitary exposure* of mismanagement; on the other hand, *on every part of his estate*, the most forcible and convincing exhibitions were given of a well selected rotation, and of the most indefatigable and devoted attention to business.

Some members of the committee believing that additional information to that given in his "Memoir," could be furnished by Mr. Turner, proposed that he should be required to answer questions which they were prepared to propound to him, which he readily consented to do. They are presented, with their answers, to the society, in the simple garb and laconic form they first appeared; in that shape they will be more acceptable to farmers. They follow in order:

Quest. 1*st*. What quantity of stone-fencing have you on your farm; and was it all built by your own hands?

Ans. I have a few roods less than 700. When I commenced, I employed a man to work with my blacks, who aided in building a few roods.

Quest. 2*d*. Do you ever vary your quantity of seed wheat, per acre, with the different qualities of the soil?

Ans. My practice is not to vary the quantity of seed, in consequence of the difference of my soil not being considerable; but were I to vary, I should put a less quantity on thin land.

Quest. 3*rd*. Have you of late years increased your quantity of seed?

Ans. I have, since my lands have improved; having put formerly one bushel, whereas I now sow from seven to eight pecks. I am of opinion that thick sowing is preferable to thin.

Quest. 4*th*. What is your experience on the subject of seeding wheat as to the depth of deposite?

Ans. I consider the depth of deposite above four inches dangerous; if the ground is well prepared, the bare covering of the earth is sufficient.

Quest. 5*th*. Do you think it desirable that the ground should be much pulverized for the reception of seed wheat?

Ans. I should be apprehensive of its baking were the earth made too fine; clods of small size would be preferable.

Quest. 6*th*. When you first took possession of your farm, what was the average crop of wheat and corn per acre?

Ans. In 1804, when I first took possession, my average crop of wheat was about twelve bushels per acre; and of corn, five barrels in a good season would have been considered a great average.

Quest. 7*th*. Was the improvement which has been made in your farm produced by the expenditure of any other resources than those derived from the production of the farm?

Ans. By none other.

It will appear, upon reference to question the first, alone, that on Mr. Turner's farm there is nearly 700 roods of stone-fence. The remainder of his fencing is made in the neatest manner of locust stakes and rails. On the whole farm your committee were not able to find a *pannel* that would not be considered good. They were particularly struck with the number of *fine gates*, (twenty-one,) admitting ingress and egress, (generally in a direct manner,) with every field. Mr. Turner's barn is a valuable one—his barn-yard judiciously laid off—his stables are roomy and comfortable—his arrangements for the preservation of his grain after it is thrashed and cleaned—his horse-feed when ground, implements of husbandry, &c. are such as afford strong evidences of good management, and offer to every farmer valuable hints.

On the 24th of this month, Mr. Bushrod Taylor, of Frederick, who had previously announced himself as a competitor, accompanied the committee over his farm, and afforded them every facility

in his power to investigate, minutely, *his* claim. Your committee had got but an imperfect view of Mr. Taylor's farm, before they discovered sufficient assurances that they were where a system of management existed. In approaching Mr. Taylor's house you pass through the centre of his farm, and leave three square fields on the right, the same number on the left, presenting that gentle undulation so desirable in a Virginia farm, where the lands are liable to baking. Around these fields there is the most uniformly good fencing that your committee have ever seen in Frederick, and at the corner of each an admirable and lasting gate. His fences are made of substantial locust posts, well pinned together at top, and placed alternately fifteen inches from a strait line, so as to form, when it is completed, a worm of double that distance, (2 1-2 feet.) The rails are laid upon a stone foundation, and in *every respect* the fencing is such as particularly pleased the committee. When your committee state that Mr. Taylor's farm is laid off in the northern style, they hope they will be considered as saying much in its favor. His plan of dividing a farm of 165 acres of cleared land into three lots of 10 acres, and six fields of 22 1-2 acres each, they highly approve of; because they believe with our soil, and in our country, *a few fields only on a farm* are totally inconsistent with an improving rotation.

Considering Mr. Turner justly entitled to the premium—because "his crops, allowing for the difference of force employed," are at least *as good*, "his method of improving the land" and "his rotation" *better*, and other manifestations given of his being a "*better manager of a farm*," and "*more deserving of reward*"—your committee do with much pleasure award it to him. They deem it not impertinent to ask of Mr. Turner that hereafter he should not conceal his "lights under a bushel," but that he should endeavor to do good by precept as well as example. To Mr. Taylor they would say, "*go on, do well, and thrive;*" and to the society, that they regret they had not placed under their control another premium. The most pleasant part of their duty is to reward merit where they discover it.

The trustees have, to the best of their abilities, performed the duties of their laborious and unthankful office, without the hope or the wish of any other reward than the promotion of the public good. Under these assurances they doubt not their decision will meet the approbation of high-minded and generous competitors.

By order of the members,

WM. M. BARTON,
President of the Board.

A. S. TIDBALL, *Sec'ry.*

AN APOLOGY FOR "BOOK FARMERS."

To the Editor of the Farmers' Register.

I believe it is a rule of evidence in our courts of law, that general concurrent opinion, expressed by long existing and public report, is good testimony to fix the good or bad character of any individual. We cannot expect the public to be more strict in scrutinizing and rejecting evidence than are our judges; and by the testimony of common report, and general opinion, "*book farmers*" are already condemned to take their place among the class of *bad farmers*—and placed even in a lower rank than the greater number of that numerous body. There has been truly so much justice in this decision, in the greater number of cases, that it is difficult to establish any exceptions—and almost as difficult to obtain an admission that there can be any valuable instruction in the writings of those who have been confessedly unsuccessful as practical farmers. It is not only that this low estimate of farmers who write, or who are even addicted to reading on agriculture, is made by those who do neither, but we may find in the expressions of writers themselves, that they concurred in this opinion, as to their fellows. In this manner, the most distinguished names have been treated. Those men who undoubtedly have rendered the most important services to agricultural science or art, were probably, without exception, ridiculed by their neighbors for their practical operations—and have been indebted to strangers for all the reputation they may have acquired. But without regarding merely verbal, and, therefore, evanescent censure, I will offer a few proofs of how "writing farmers" have stood with each other. Lord Kames, to whom Scottish agriculture owes so much, is the subject of sundry standing jests in print, all of which go to show him very much wanting in practical knowledge, as a farmer. Marshall, who has written so many volumes on agriculture, and who is quoted with so much respect, is spoken of in the Edinburgh Farmer's Magazine, with contempt. Arthur Young, the most distinguished, as well as the most voluminous writer on agriculture, the one who stands perhaps the highest among its zealous and effective friends, is thus addressed by the reviewer of his Agricultural Survey of Lincolnshire: "If we turn our observations to Bradfield farm, in Suffolk, the *seat of your improvements*, the most useful lesson of practical husbandry may be instantly learnt, by adopting the contrary of your example. Were the practical husbandmen of Suffolk, within the circle of your fame, questioned by an inquisitive traveller, respecting who was the worse farmer in the county, they would immediately answer *Arthur Young.*" Young himself speaks of the celebrated Rozier, whom he visited during his travels in France, in such manner as to show that he considered him utterly ignorant of the subject on which he had written so much. Davy's chemical facts, in his work on agricultural chemistry, could not be attacked—but his deductions from them have been often made light of, with sundry sneering allusions to his being unacquainted with practical farming. In our own country, Judge Peters has been held up as a wretched farmer in Lorain's Husbandry—the author of which, in his turn, may meet with equal censure from some other quarter, if he has not already paid that penalty. Others of our countrymen who have written on agriculture, though perhaps not yet denounced in print, have equally earned their common reward in the public estimation.

This state of things is indeed strange. It will not be denied on the one hand, that there is much of exaggeration in these censures: but on the other, it must be confessed, that there must be some solid foundation for such generally prevailing opinions. I do not undertake to defend the practical operations of writers on agriculture—neither on account of their imperfections, do I deny

their theories, or their written instructions: and it will be the object of these remarks to show that there are causes for their practice being generally unprofitable, even when their theoretical opinions, and instructions for practice, may be both sound and valuable.

To enable a man to make discoveries or improvements of value, in any art or business of a civilized people, it is requisite that he should be directed to such investigations by natural genius, by education, and early habits; and also by a degree of enthusiasm and ardor for a favorite object, which causes it to be the sole object of pursuit, to the neglect of others perhaps of equal importance. Fortunately for the success of such projectors of improvements, most of the arts, and our complicated employments, have been divided into as many separate departments as the proper *division of labor* requires, and each man may find employment for his intellectual, as well as physical powers, in the particular pursuit in which he feels most interested, without being distracted by any other engagements. When Arkwright (for example) had, after the study of years, conceived his plan for spinning cotton by machinery, which has, by its success, revolutionized the manufactures and commerce of the world, he had only to bring his directing mind to bear on workmen and materials of every, and the most perfect kind, to have his schemes reduced to practice. He had only to give general directions, to state what he wanted, and whatever could be made with wood and metal, in the hands of the most skilful workmen, was soon ready for his service. But if Arkwright had not had such mechanical aids—had he been compelled to superintend and to direct every particular operation, even from the cutting of his timber, and melting his metallic materials—and at last to be himself the cotton manufacturer, and the controller of its numerous laborers—there can be but little doubt that this great discovery would have completely failed. Arkwright would either never been known except as the dreamy and indolent barber, whose schemes were considered (even by his own wife) as leading to starvation instead of riches—or would have become bankrupt as a manufacturer, because less capable of managing men and women, than to contrive, or even to construct the most complicated mechanism. It is unnecessary to cite other individual examples. The fact is notorious that most of the men to whom the world has been most indebted for valuable improvements, have been such poor economists and managers of their business in general, as to have lived and died poor. But we do not think the less of the value of the thrashing machine, the cotton saw-gin, and the steam boat, because Meikle, and Whitney, and Fulton, obtained almost nothing from the sources of wealth which their several inventions offered to themselves, as well as to the world.

If a man has capital, prudence, energy, and general intelligence, he may succeed in many branches of business of great extent and complication, though possessing but little knowledge of any particular process—because he can call to his service talents of every kind desired, all made perfect in their separate and limited departments. But not so in farming. In this business (particularly in this country) there has been almost no division of intellectual labor—and the farmer must understand every operation, and superintend and direct every laborer, or his interest will surely suffer. There is more natural and peculiar talent required to manage a large farming business, than to command an army, or to be a passable minister of state—and there are fewer of the former, than there are men who are even renowned as warriors or statesmen. The more ignorant the laborers are, and the more imperfect the materials of every kind, so much the more of varied and extended talents are required in the directing mind: and, therefore, it is much easier to be a successful farmer in England than in Virginia. If Mr. Coke, who has acquired and deserved so much fame for the excellent management of his Norfolk estate, could be placed in lower Virginia, to direct as large a business through overseers and negroes, he could not by the apprenticeship of a long life, learn to make any clear profit. His general plans might be supposed to be faultless, and nothing wanting to carry them into effect that capital and judicious general arrangements could supply: still every thing would fail, more or less, in execution, because it would be impossible that Mr. Coke could know how to provide for the most minute requisites, and also see that every thing, however trivial, was executed. He would be, in fact, placed in the situation of a merchant, who before being able to build and employ a ship, would have to direct the preparation and use of every material, and then the mode of navigating the vessel—every order being supposed to be executed by ignorant and unwilling agents.

It is for these reasons that farmers who are sufficiently zealous in pursuit of some object, to write for the instruction of others, are seldom qualified to attend well to all the details which a farmer's business requires: and even were it otherwise, the habit of writing would probably withdraw from business that continual superintendence, and unbroken occupation of the mind, which is essential to good management in business of every kind. The enthusiastic schemer, devoted to one object, whether he succeeds or fails in that pursuit, will very surely not succeed in general management.

If, then, it were admitted that every writer on agriculture was really as bad a farmer as has been charged by the spirit of ridicule, or by malice, it would by no means follow, that their instructions might not be highly valuable, even to such as were much better farmers (in practice) than the writers themselves. From each one, perhaps, something of value may be gained, though he may be deficient in most, or in all other respects.

But it is not only the writers, but the readers of books on agriculture that fall under popular ridicule, and every marked deficiency exhibited on the lands of any "book farmer," is attributed to his applying to books for instruction. It will be found, however, upon investigation, that such bad management is almost always in violation of written instructions, instead of being in accordance with them. It is true, that we may find in books plenty of erroneous doctrines, and of true doctrines totally unsuited to our circumstances; and that sometimes, we err by following such wrong guidance: but errors of practice like these, are rare, and may easily be avoided by a discriminating judgment.

With these views, I do not consider it necessary

that agricultural books should be perfect, to render them valuable and instructive—and that the practice of a farmer should be good throughout, to make his example valuable in some, or perhaps many respects. I therefore readily accord the highest degree of merit to John Taylor, as an improving farmer, and a benefactor to our country, although it is said that his plough-gear, and implements were of the lowest order—to eulogize the efforts, and highly prize the success of R. K. Meade in improving the live stock of Virginia, without enquiring into the profits of his tillage—and (if you will permit such an illustration) Mr. Editor, I am content to profit by your opinions on calcareous manures, and your successful practical use of them, without testing them by your general management as a farmer, which I have heard is very far from being commendable.

But I have conceded too much to our adversaries, by discussing this question on their own premises. I deny that reading ever made any man a worse farmer. Books, and agricultural books, may serve to occupy the leisure of many an indolent farmer—but in that case the occupation is not the cause, but the effect of negligent habits, and serve to lessen instead of increasing its ill effects. Of those who thus neglect their business, there are hundreds who change their pursuits to pleasure or vice, while one does to study. It would also seem, from prevalent opinions and sarcasms, as if no reading farmers were successful in practice. So far from this being the case, there are few of the best farmers in Virginia, who have not been diligent and extensive readers of agricultural works, and who do not owe much of their success to the general information thence acquired. I might name many striking examples—men who are known by reputation throughout Virginia, as judicious and successful practical farmers—of whose claim to this distinction there would be no question, and who stand so high in this respect, that they are altogether unsuspected of the sin of reading agricultural books.

If any of our despisers of theoretical and book farming, were asked by a foreigner "who are the best and most successful practical farmers in Virginia?" the answer would most certainly include the names of several persons whom I know to be among the most extensive readers of agricultural books in general, and who would not hesitate to acknowledge their great obligations to these sources of instruction. Indeed, but for the general and strong prejudices on this subject, it would seem as idle and as ridiculous to adduce arguments to support my position, as to prove the general proposition that the pursuit of knowledge is aided by instruction.

I will readily admit that a habit of reading works on agriculture, does not always help to make a good farmer, any more than a habit of hearing sermons always makes a good christian: but that admission does not include, what is generally claimed, that reading is injurious to working men. I will illustrate my view, by repeating a story which I have heard brought up for the purpose of condemning and ridiculing reading farmers. In one of the counties adjoining the Blue Ridge, some twelve years ago, there were two adjacent farms, very similar in every respect, except for their condition and management; the one exhibiting every mark of care, industry, and economy, while the want of these, and dilapidation and waste of every kind, were as conspicuous on the other. A traveller who passed by the latter farm, on his way to visit the owner of the former, was forcibly impressed with the apparent contrast, and asked his host to explain the cause. "The reason is plain enough," was the answer; "while my neighbor is in the house reading the American Farmer, I am ploughing." But the fault in this case was the indolence or carelessness of the farmer, and not in the particular amusement or study for which his work was neglected. If he had spent the same time in gaming, drinking, hunting, or paying visits to other idlers, his farming would not have been better. Nothing will compensate for the want of industry and economy: but the farmer who possesses these indispensable qualifications, will always be greatly benefited by intellectual improvement, and by the most extensive acquaintance with the opinions of the best farmers throughout the world: and these opinions are only to be found in books.

After offering these observations, it will not require the signature to show that I am one of those who bear the reproach of being

A BOOK FARMER.

STEAM CARRIAGES ON THE LIVERPOOL RAILWAY.

Extract from Dr. Lardner's Lectures on the Steam Engine.

Some time before it was opened a contest took place on this railway between three different steam coaches. The Rocket, constructed by Mr. Stevenson; the Sanspareil, by Mr. Hackworth; and the Novelty, by Messrs. Braithwait and Ericson, for a prize of £500, offered by the directors to that which should accomplish the greatest distance in the shortest time. On this occasion the Rocket, which gained the prize, went over the space of 30 miles in 2 hours 6 minutes and 49 seconds, being at the average rate of 14 1-5 miles per hour. But in the course of the journey it sometimes proceeded at the rate of above 29 miles an hour, and its slowest motion was about 11 1-2 miles in that time.* In May last, Dr. Lardner saw the engine called the Victory draw on the same rail road the weight of 92 tons 19 cwt. 1 quarter, in twenty wagons, together with its tender containing fuel and water, from Liverpool to Manchester, a distance of 30 miles, in 1 hour 34 minutes and 45 seconds, besides 10 minutes spent in taking in water. The speed on this occasion was in some places 25 1-2 miles an hour, and on level ground, where there was no wind, it was generally 20 miles an hour. On another day, the engine called the Samson, drew fifty wagons laden with merchandise, and, with itself, making a gross weight of above 233 tons, the same distance in 2 hours and 40 minutes, exclusive of delays upon the road for watering, &c. the rate of motion having varied from 9 to 16 miles an hour, and being on an average nearly 12 miles an hour. The coke consumed in this journey was 1762 lbs. or a quarter of a pound per ton per mile. The attendance required is only an engine-man and a fire-boy, the former of whom is paid 1s. 6*d.* for

* In another place Dr. Lardner states that "the engine which conveyed Mr. Huskisson to Manchester, after the unhappy occurrence which took place at the great trial, moved at the rate of 35 miles an hour."

each trip, and the latter 1s. The expense of the original construction of the engines, however, and of their wear and tear is very great, though not nearly so great on the latter account, Dr. Lardner assures us, as has been sometimes stated. The price of one of the most improved engines at first, is about £800, and it will travel from 25,000 to 30,000 miles without costing as much more for repairs. Notwithstanding many extra expenses which this undertaking, as the first of the kind, has had to bear, and from the experience purchased by which future speculators will profit, it has been perfectly successful in a commercial point of view. The profits on the capital invested have been from the first above 6 per cent. per annum; and during the latter six months of 1831, it was at the rate of above 8 per cent. per annum; and it has since probably exceeded that amount. The original £100 shares already sell for above £200. On the other hand, the advantages to the public have been as great as to the proprietors. Fully 600,000 passengers now pass by the rail road in the course of the year between Liverpool and Manchester, or four times as many as used formerly to make the journey. The transference of merchandise is also effected both with infinitely greater speed, and at a vast reduction of expense.

Some time ago a work was published by Mr. Gordon, the engineer, on the application of steam as a moving power for coaches on common turnpike roads; the facts contained in which were principally derived from the report on this subject of the Committee of the House of Commons, which was ordered to be printed on the 12th of October last. Dr. Lardner has here availed himself of the information supplied by the same most interesting and important parliamentary paper; some of the curious details given in which we may possibly take another opportunity of laying before our readers. In the meanwhile we can only afford room for the general conclusions to which the committee came on the evidence brought before them. They are as follows:

"1. That carriages can be propelled by steam on common roads at an average rate of ten miles per hour.

"2. That at this rate they have conveyed upwards of fourteen passengers.

"3. That their weight, including engine, fuel, water, and attendants, may be under three tons.

"4. That they can ascend and descend hills of considerable inclination with facility and safety.

"5. That they are perfectly safe for passengers.

"6. That they are not (or need not be, if properly constructed) nuisances to the public.

"7. That they will become a speedier and cheaper mode of conveyance than carriages drawn by horses.

"8. That, as they admit of greater breadth of tire than other carriages, and as the roads are not acted on so injuriously as by the feet of horses in common draught, such carriages will cause less wear of roads than coaches drawn by horses.

"9. That rates of toll have been imposed on steam carriages, which would prohibit their being used on several lines of road, were such charges permitted to remain unaltered."

"The toll-bills complained of have since been repealed. "At the moment that I write," says Dr. Lardner, "several steam carriages are in process of construction for regular work upon the public roads of England. Some are about to be established between Paddington and the Bank, upon the New Road; others between London and Greenwich, and other places in the vicinity of the metropolis. Another, it is stated, is to run between London and Birmingham. The first impulse once received, the progress will be rapid, and the effect of proportionate importance."

ON MALARIA.

Extracts from *Three lectures on the origin and properties of Malaria and Marsh Miasma*, by Professor MAGILL, of the University of Virginia.

[The pamphlet from which the following passages are extracted has very lately issued from the press. There is scarcely any subject which more needs investigation; and but few are of more importance to agricultural interests in a large portion of the United States.]

"The subject of malaria, or marsh effluvium, has for a long time attracted much of the attention of the medical profession, and interested to a high degree the feelings of society at large. Physicians of all countries have tortured their brains, and exhausted all the known resources of the chemical art, in attempting to discover the properties of this invisible agent of disease and death, which prostrating in its silent march whole cities and communities, bids defiance to all the measures hitherto suggested to stay its destructive progress. Unquestionably it is one of the most important subjects which can be presented to the contemplation of man; to detect the causes which originate; to ascertain and define the laws which regulate, and to discover means by which the human family may be shielded from this "pestilence which walketh in darkness," would form a suitable and noble employment for the philosopher and philanthropist, as well as the physician.

"None of all the many "ills which flesh is heir to," has probably been so prolific of destruction and misery to the race of mankind, as miasmatic exhalation.* In all quarters of the world except the frigid and ice-bound north, where perpetual winter "rules the year," this scourge of humanity, has been occasionally found, breathing disease and death upon all within the range of its morbific influence. In the east and in the west, its withering and desolating effects have been felt in all their terrific severity.† Along the classic shores of the Mediterranean it has poured with a liberal hand the "vials of its wrath."‡ The shores of

*It is computed that upwards of one half of the human race perish by fever (in one or other of its forms.) Miasma is the principal if not the only cause of febrile disease.

†According to the report of the committee, consisting of Dr. W. Ainslie, president, and Mr. A. Smith, and Dr. M. Christie, the fever which prevailed in the provinces of Coimbatore, Madura, Dindigul and Tinnivelly, in the years 1809, 1810 and 1811, consigned to the grave 106,789 persons, to which may be added the ruin of the constitutions of many thousands.

‡Of all the countries lying along the Mediterranean, Italy has probably suffered most from malaria. Rome, once the proud "mistress of the world," in her career to greatness and splendor, had often well nigh been annihilated by the blighting hand of pestilence. Livy mentions the occurrence of fifteen plagues before the year Ab. Urbe Condita 59, and no one now doubts that they were produced by the pestiferous exhalations

Africa, that region of mental darkness, though harmless to the natives, are fraught with the seeds of disease to the European and American constitution. Witness the lives that have been and still are annually sacrificed npon the altar of Colonization. The extensive marshes of the Netherlands have often proved the sources of severe and wide-spread disease.* Our own highly favored land almost throughout its entire extent, has frequently been visited by extensive and malignant epidemics, increasing in frequency and severity as we proceed southward. The bold and majestic rivers which flow through our country, and beautify its scenery, often prove the source of destructive epidemics. The "king of rivers", the grand and magnificent Mississippi, like the Nile of Egypt, and the Ganges of the east, while it fertilizes the soil by its extensive annual inundations, spreads at the same time far and wide the seeds of disease."

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"The steeping of hemp and flax, in stagnant shallow water, ("*ubi palustres disident aquæ, ventique silent*") in consequence of which it has putrified, has also been productive of disease. Lancisi "gives the history (says Bancroft) of an epidemic commonly intermittent, and often resembling the tertiana lethargica of *Forti*, which for several summers infested, and almost depopulated the ancient town of Urbs Vetus, in an elevated and salubrious part of Etruria; and which was occasioned by ponds or stagnant waters in the lower part of the town, in which hemp and flax were macerated: (*in quibus linum, et cannabis macerabantur,*) but this being prohibited in 1705, the fevers did not afterwards occur."

"Fevers have also been known to arise from the putrefaction of "the vast heaps of indigo plant, which are negligently formed, (after the coloring principle has been extracted) near the works and houses of the laborers, and there left to decompose and become manure, which is of an excellent quality, after two or three years. These heaps wetted from time to time by heavy rains, and afterwards heated by the powerful rays of a vertical sun, emit very copiously, vapor, or miasma, resembling in their effects those of marshes, for those persons who live near to, and especially on the leeward side of these fermenting vegetable masses, are commonly attacked by fevers, chiefly remittents, and similar to those which prevail in marshy situations. And according to my information (continues Bancroft) the connexion of these fevers with the heaps of fermenting indigo plants is now so well understood and believed in that part of the world, (East Indies,) that the more intelligent indigo makers no longer permit such heaps to be formed near their works, or the habitations of the workmen, but cause them to be placed at considerable distances, and to the leeward thereof, and thus preserve their laborers in health." Many other instances might be mentioned in which malaria was produced by vegetable putrefaction, but those cited are deemed sufficient to prove the position with which we set out."

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"We have already mentioned that four things are necessary to the developement of malaria; namely, heat, moisture, vegetable matter, and the contact of air; if any one of these requisites be absent, malaria is not produced. From this fact then we may deduce many of our preventive means; for by removing any one of them we arrest the exhalation of this gas.

Vegetable matter, with the co-operation of heat and moisture will every where produce disease, hence the great necessity of enforcing the utmost cleanliness in all large cities and towns, particularly the removal of all collections of vegetable matter. The streets, yards, cellars, ponds, gardens, stores, &c., should all be made to pass through the most rigid inspection. Much good has resulted from following this course, and dreadful distress has been occasioned by neglecting it. Dr. Rush observes, "in a manuscript of the life of doctor (afterwards governor) Colden, of New York, there is the following fact: It was first communicated to the public in the daily Gazette of the capital of that state, on the 30th of October, 1799." "A malignant fever having raged with exceeding violence for two summers successively in the city of New York, about forty years ago, he communicated his thoughts to the public on the most probable cause of the calamity; he published a little treatise on the occasion in which he collected the sentiments of the best authority, on the bad effects of *stagnating waters, moist air, damp cellars, filthy stores* and *dirty streets.* He showed how much these nuisances prevailed in many parts of the city, and pointed out the remedies. The corporation of the city voted him their thanks, adopted his reasoning, and established a plan for draining and cleaning the city which was attended with the most happy effects."

"The United Provinces of Holland, (says Rush) hold their exemption from the plague only by the tenor of their cleanliness. In the character given by Luther of Pope Julius, he says "he kept the streets of Rome so clean and sweet, that there were no plagues nor sickness during his time."

"Ponds of water should never be allowed to exist in cities or towns, or even in their neighbor-

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from the neighboring marshes. One would have supposed that these severe visitations, before she had acquired the bone and muscle of maturity would have given a permanent check to her growth, but the cupidity and enterprise of man can triumph over apparently insuperable difficulties. All that portion of Italy too, which is bounded on the one side by the Mediterranean, and by the Appennines on the other, and extending from Pisa on the north to Terracina on the south, has been rendered a complete desert by the malaria in which it abounds. This portion of the country (says Griffith) is almost uninhabited, "and the appearance of the few wretched beings whom necessity detains there is frightful in the extreme, exhibiting the effects of the noxious exhalations in every form of bilious disorder." Other countries along the sea coast, have also occasionally suffered from this scourge most severely. In Gibralter, in 1804, out of a population of about 10,000, there perished from the 1st of September to the 31st of December inclusive, 5,946 individuals, being more than one-half of the inhabitants. In 1810 another destructive pestilence ravaged the same place, which is clearly proved by Dr. Burnett to have arisen from marsh exhalation. In Cadiz in 1800, out of a population of about 60,000, the number of the affected from the beginning of August to the first week in November, amounted to 48,520.

*The famous Walcheren expedition of the British in the year 1809 is still fresh in the recollection of many. Out of sixteen thousand troops, constituting the whole British force, there was on the 23d of September 9,800 prostrate with the fever.•

hood. In such situations they too often become the reservoirs of offal matter of every description; which either by gradual accumulation, may finally rise above the surface of the water, as happened in the instance related by Senac, or by evaporation of the water, may become exposed to the action of a hot sun, and in either event may exhale miasmata in abundance.

"But as we have before observed, marshes, strictly so called, are the most fruitful sources of miasmata. These abodes of this pestiferous air, from their great extent and other circumstances, will often not admit even of any attempt to change their nature; and all that is left us in such cases, is to interpose between them and us, the barriers to the progress of malaria with which nature has kindly furnished us, and which will be mentioned in a future part of this lecture.

"Though, however, in many cases no favorable change can be effected, in numerous other instances much has been done to redeem marshes from their noxious state. The experience and industry of man have often triumphed over these laboratories of malaria, and from having been shunned as the foci of disease, they have been converted into the abodes of health and plenty. By a judicious use of ditching, so as to drain the soil of its superabundant water and subsequent cultivation, by which the earth, being frequently turned up to the drying action of the sun and air, wonderful changes have been effected. "With the aid of the purifying sea breeze, this course, (says Ferguson,) at the British colony of Demarara, within six degrees of the equator, has succeeded in rendering the cultivated portion of the deepest and most extensive morass probably in the world, a healthy, beautiful, and fertile settlement."*

"The *Campagna di Roma*, now the abode of pestilence, was once comparatively healthy, and was indebted for it in a great measure to the "constant tillage," and "to the extreme attention paid to draining the deposites of stagnant water," and to the aqueducts which then traversed it in every direction. "These, however, being broken down and destroyed by the Goths, by which the country became overflowed, it soon became excessively sickly.

"In the neck below Philadelphia, since it has been drained, its agues have disappeared."

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"The clearing of wet land, should be followed up immediately by cultivation. Land of this description having on it a growth of timber, should never have its wood cut down without the specific purpose and power immediately to devote the soil so cleared to agricultural uses; because experience has taught that the *mere clearing* of marshy land, is almost certain to be followed by disease in its neighborhood. In proof of this, Dr. Rush says, "it has often been observed, that families enjoy good health, for many years in the swamps of Delaware and North Carolina, while they are in their natural state, but that sickness always follows the action of the sun upon the moist surface of the earth, after they are cleared. For this reason the cultivation of a country should always follow the cutting down of its timber, in order to prevent the new ground becoming, by its exhalations, a source of disease."

"Dr. Robert Jackson also says, that "in this country, (America,) the unhealthiness of a place is often obviously increased by cutting down the woods of the neighboring swamps; therefore, no rule is more liable to exceptions, than that which has been so generally enforced, namely, that clearing a country of its woods invariably renders it healthy; unless the grounds be drained and cultivated as well as cleared, the effect is likely to be the reverse."

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"Many places, previously healthy, have become immediately sickly upon cutting down an intervening wood between them and the marsh, and on the other hand, many situations before sickly have been rendered healthy from the growth of trees between them and marshy grounds. Dr. Jackson says, "histories abound with examples of destructive epidemics, which have followed the cutting down on the groves which covered morasses or intercepted the approach of malaria."‡

Dr. Lisle in his memoir on malaria, translated by Dr. Johnson, and incorporated in his work on tropical climates, says "upon Mount Argintal, above the village of St. Stephano, there is a convent which has lost all the reputation for salubrity it once enjoyed, since the lofty trees by which it was surrounded have been cut down."

"He also says, "I have been informed by persons worthy of credit, that in consequence of felling the wood before Asterna, near the Pontine marshes, Veletri was visited for three successive years by disease which made much greater havoc than usual throughout the whole country."

—

"We will now mention those means of obviating the effects of malaria, which are furnished us by our knowledge of some of its properties. The first rule we would suggest under this head, and it is one of cardinal importance too, is by all means to avoid the evening or night air, as well as an exposure to the atmosphere of the morning previous to sunrise. The reason of this rule will be obvious, when it is recollected that miasma is dispersed by heat of the sun, during the day, and that as soon as he withdraws his beams and sinks below the horizon, it begins to descend, and remains in the lower strata of atmosphere, until it is again rarified and dispersed by his kindly rays. The instances already cited, show conclusively this characteristic of malaria, and will impress more strongly than any words of mine can do, the necessity and advantage of the caution suggested."

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"De Lisle says, "the evening dew is so much dreaded at Rome, that as soon as it begins to be perceived, all the inhabitants shut themselves up in their houses:" and again, "the people of Italy, and I suppose of all countries where the air is bad, never go abroad, unless absolutely obliged, till after sun rise, when the heat has dispersed the pernicious vapors that have fallen during the night."

—

"In the next place we would recommend, that the upper apartments of houses should be used for sleeping; experience clearly establishing the fact, "that the lower you are the denser are the strata

* Phil. Journal, No. 13, p. 20.

of miasmata," and consequently the more violent the effects arising from it. We have already mentioned several examples in proof of the superior salubrity of the second stories of houses, and need not repeat them here."

—

"The burning of a number of fires so as to disperse the malaria, by the artificial heat thus created, has often been used with good effect, in warding off its attacks. Heat produced in this way, no doubt operates in the same manner as the heat of the sun, dilating and rarifying the gas in question, and forming an upward current, by which it is carried off."

ON RIDGING THE GROUND FOR MELONS.

From the Genesee Farmer.

I read the communication of my worthy friend W. W. B. on ridging the ground for melons with respectful attention, and have since appraised him that when ready, I would attend to the subject. He suggests that his failure was "probably in part owing to *the season*, and partly to the nature of *the soil*," with which I acquiesce. *The season* was remarkably unfavorable to the growth of melons. I have inquired of four of our best gardeners, who have generally been very successful in this culture, and their answers have all been nearly to the same import: no success, or only a few melons of inferior size. Their grounds were *not ridged.* To this testimony, I may add my own; and though I planted in a ridge, my water melons were very few and inferior; but my mush melons were good, and some were truly excellent.

I think there can be no doubt that the soil in which melons are cultivated, should allow a quick transit to the water in rainy weather. I was interested with Judge *Buel's* account of the experiment of *underlaying the bed with straw three inches thick.* In a late conversation with an excellent farmer, he remarked that he had generally been successful in growing melons, whenever he had planted on a sod ploughed up and down the slope, so that the water could drain off *under the sod* along the bottom of the furrows. He was careful to apply rich compost, or some equivalent manure to hasten the vegetation of the plants; and he considered this of more consequence, as the earth on a sod newly inverted, is often crude and not sufficiently pulverized.

From the following communication, written by my esteemed friend Dr. *Stephen Mosher*, at my particular request,—it would appear that melons do best when the stable manure is *in a mass* and covered up with earth. In my ridge it was *mixed with the soil:*

"I received yours of the 31st ultimo, requesting the particulars of my success in raising melons on mounds and ridges. My first trial was on a new piece of sward ground which was ploughed for the purpose of forming a garden. On this I had drawn three loads of fresh stable manure, which was thrown into one heap, and covered with inverted sods to the thickness of six or eight inches, in the form and manner of covering a large potato hill, which was when finished, perhaps four feet high, and ten feet in diameter. On four sides about half way to the top, I made four excavations through the turf and *into the manure*, about eighteen inches in depth and diameter, *partly* filling the holes with fine rich earth so as to form four level hills. In each of these I planted five or six water melon seeds of what we call the Carolinia variety, at the same time that I planted about four square rods of the ground surrounding the heap, at the usual distances, with the same kind of seed. Within three days, the seed on the mound came up and grew most luxuriantly, while those planted in the adjacent ground, did not come up in less than fifteen days. During this time, the weather was unusually cold for the season; and though several frosts occurred, yet the plants were not damaged in the least. When those on the level ground came up, pale and sickly,—each of the former had four large green leaves.

"The result was, these four hills planted on the mound, soon began to run, and took possession of nearly the whole four square rods, against which progress those on the ground made but a feeble resistance. And from these four hills I am sure I had a good wagon load of as fine melons as I ever saw. From one single plant alone I weighed five melons that overrun twenty pounds each—one of them weighed twenty-five pounds; and on the same vine were more than that number of smaller size. The produce of those planted round the heap was small and of little value.

"The last season, I varied the experiment by digging a trench three feet wide, eighteen inches in depth, and some rods in length,—throwing the earth out on each side. This trench was filled to the level of the common earth with fresh stable manure, as in the first experiment, when it was levelled and firmly trodden down. The earth, consisting of a *sandy loam*, was then thrown back on the manure, forming a ridge about a foot in height, gently rounded on the top. Along the middle of this ridge, I planted seed, both of the water and mush melon, which came up in about four days, and grew luxuriantly, *suffering less in dry weather than plants in the vicinity on the level ground*, and producing *an abundant crop of very fine melons.*"

These results are entirely in favor of ridging; but of the propriety of treating in that manner such a soil as W. W. B. cultivates, I presume not to judge. That kind of land however, constitutes but a very small proportion of our country. A heavy loam is the most prevalent,—though sandy tracts, and some of considerable extent, occur in different places. It may therefore be safe to conclude from the experiments reported, that melons should be planted on mounds or on ridges in nine-tenths of the gardens in the Genesee country. D. T.

Greatfield, 4 mo. 21, 1834.

HORSES IN BRAZIL.

The great increase of these animals, in a land where none of the same genus had existed before the discovery, altered even the physical features of the country. The bulbous plants and the numerous kinds of aloes (*pitas* or *caraguatas*) with which the plains were formerly overspread, disappeared; and in their place the ground was covered with fine pasturage, and with a species of creeping thistle hardy enough to endure the trampling by which the former herbage had been destroyed. The insect as well as the vegetable world was affected, and the indigenous animals of the country, birds as well as beasts of prey, acquired new habits.—*Southey's Brazil.*

ANSWER TO AN ILLEGIBLE LETTER.

[Archdeacon Coxe wrote so illegibly as to draw from a friend the following good humored reproof. The plan suggested might be adopted with as much advantage by some of our correspondents, as by him for whom it was proposed.]

Mongewell, Jan. 8th, 1798.

'Dear Sir,—A Frenchman of high rank under the monarchy, answering a letter which he had received from a person of similar rank, expressed himself thus:—"*Par respect, Monsieur je vous ecris de ma propre main; mais, pour faciliter la lecture, je vous envoye une copie de ma lettre.**" I will in future forgive the want of respect, if you will have the goodness to follow this Frenchman's example. I wish to comply with your request, for so far I can decipher, that there is a request—but I must beg to know from your amanuensis what it is.

'I am, dear sir, with much regard,
Your faithful servant,
'S. DUNELM.

A VISIT TO HOFWYL.

From the London Penny Magazine.

We have received the following interesting communication from a correspondent upon whose accounts we can place a full reliance. The establishments for education, which have been founded and matured in Switzerland, by the public spirit and laborious perseverance of M. Fellenberg, have now existed about thirty-two years. Their high merits have been long familiar to the English public. At the present time, we understand that certain political dissensions, which have produced much ill-will and unhappiness in the canton of Berne, have had the common effect of all violent contests of opinion,—they have made men indifferent or opposed to those institutions for the amelioration of the human character, whose great object is to elevate our species above the intolerance and narrowness of party-feeling. We trust that the open or concealed hostility which, it is said, now threatens the excellent establishments of M. Fellenberg will speedily be put to shame by the good sense of the people of Switzerland; who will perceive in such institutions the surest preservation against the outbreaks of a mistaken zeal for freedom, on the one hand, and the tyranny of exclusive pretensions, on the other.

In the month of August, 1832, I travelled into Switzerland for the purpose of making myself acquainted with the schools and institutions at Hofwyl. Situated about three leagues from the picturesque capital of Berne, amidst a beautiful scenery, composed of a cultivated vale, the Jura ridge of mountains, a pine forest, a small lake, and the glaciers of the Bernese Alps, stand the extensive buildings of the establishment, surrounded by about two hundred and fifty acres of farm land. Upon my first arrival, before I could obtain an opportunity of presenting my letters to the benevolent founder, I wandered about in various directions,—all was business and activity. Here was a troop of lads cutting the ripened corn, while another troop was engaged in conducting it to the barns. Here was the forge in activity, and there some little gardeners performing various operations in small plots of ground that were portioned out: here were a group of little girls gleaning, there others carrying water, most of them singing while thus employed. But my attention was peculiarly arrested by about one hundred men, who in a large open building, erected in a recess of the garden, appeared to be engaged like boys in a school-room; over the entrance was inscribed this motto, "The Hope of their Country."

I was at last fortunate enough to be admitted into the study of M. de Fellenberg,—a man somewhat advanced in years, with a countenance beaming with intelligence and kindness. De Fellenberg was, by birth, one of the ancient aristocracy of the country, and in possession of the hereditary property of his family. He determined upon devoting his fortune, and the labor of a life, in the endeavor to effect the regeneration of his native land, by the means of education. "I will infuse good habits and principles into the children," said he, "for in twenty short years these children will be the men, giving the tone and the manners to the nation." For thirty-two years has he pursued his steady course, increasing in influence, and extending his establishment as his scheme grew upon him, until it has become what he described to me. "This," said he, pointing to a large building, "is the institute for the boys of the higher classes. Here are their dining-rooms;—arranged on each side of yonder galleries are their dormitories. Here you see their gardens, their museum, their work-shops, their school-rooms; here their gymnasium where they exercise themselves in wet weather, here their stream of running water where they bathe every day: study is their employment, bodily labor their recreation,—but bodily exertion I insist upon. There is no health, no vigor of mind, no virtue without it. Those persons grown to manhood, who are mixing with the boys, are placed by me to observe every action, and catch every expression. My grand object is to comprehend thoroughly the character of my pupils, in order that I may work more efficaciously upon them. These persons are by no means considered as spies by the boys; they are their companions. At Hofwyl all that is not in itself wrong is permitted. I never like to forbid a thing when I am unable to assign a reason for doing so: it creates a confusion in young minds with regard to principle, a thing most dangerous to their future happiness. We have no boundary-mark, yet my boys stay at home; we interfere not with their pleasures, yet they cling to their duty.

"Within this enclosure is my eldest daughter's poor school for girls. She has about a hundred under her direction, who are fed and clothed by the establishment. To these she devotes her entire time. They learn all that in after-life will be of service to them:—to clean the house,—to cultivate the garden,—to sew,—to make all those little necessaries which are of so much importance in the cottage; to read, to sing,—to be cheerful, and to be happy. Unless our women be brought up in modesty, and with industrious and religious habits, it is in vain that we educate the men. It is they who keep the character of men in its proper elevation.

"Here is my school for the middling classes,—here all instruction has reference to practical pur-

*Through respect, sir, I write to you with my own hand; but to facilitate the reading, I send you a copy of my letter.

poses. Man was born to have dominion over the earth, and to subdue it, but it is by the intellect alone that he can do so. His unassisted strength what is it? To conquer Nature he must understand her. Look in here, and you will see the laboratory of the chemist, and the lever and the pulley of the mechanic.

"In these two buildings are my poor school for boys, who are boarded and clothed by the establishment. And well they earn their maintenance, for the little fellows work ten hours a day in the summer; and the expense that I incur in their behalf is nearly repaid by their exertions. They study for two hours each day, and this I consider sufficient. The case here is the reverse of the Institute, for bodily exertion is the labor, and study the recreation. The habits I bring them up with are those which I desire should continue with them through life; they consequently have reference to their probable position in society. The habit of continued study would ill-become a person destined to gain his livelihood by his hands. Although there are now one hundred boys assembled here, mine were but small beginnings. I had but one pupil at first. It was long before I could find a master in whom I could confide. Do you observe those little patches of garden-ground? Each poor lad has one to himself; and the produce belongs exclusively to him. They usually dispose of it to the establishment, which either pays them the money at the time, or lodges it for them in a little bank I have founded. Many of them have very considerable sums there. It is here that they obtain a habit of passing the greater portion of their time in continued and patient labor;—they become acquainted with the value of labor by the produce of their little gardens. The instruction that I give them, although somewhat more elevated than what is generally obtained by persons of their rank in life, is directed to the rendering perfect the senses and reflection,—to make them better practical men; drawing, the sciences of arithmetic and geometry, a useful selection from the other sciences, all taught in the most unostentatious manner: the history of their native country, and an acquaintance with the different natural objects around them, together with music, form the extent of their literary instruction.

"Religion is inculcated in every way. Public prayer, both at church and at school, is regularly performed in common with the schools of other countries. Besides this, these poor lads are taught to see the Creator in his works. When their admiration is roused by a natural object, they are accustomed to direct their thoughts to its Maker.

"But here," said my venerable companion, "is the engine upon which I rely for affecting the moral regeneration of my country (and my attention was directed to the men whom I had before seen in the morning;) these are the masters of village schools, come here to imbibe my principles and to perfect themselves in their duty. These men have *six thousand* pupils under them; and if, by the blessing of God, I can continue the direction of them, success is certain."

To insure success M. de Fellenberg spares no pains,—no expense. There are no less than thirty-two professors solely devoted to his establishment, who inhabit a house to themselves upon the premises.

In all, there are about three hundred and fifty individuals in this little colony. Despite of his enemies, the spirit of De Fellenberg is spreading throughout Switzerland; and after having seen the parent institution, I visited several of his establishments in some of the remotest cantons.

A week closed my short sojourn at Hofwyl. I quitted it with a heavy heart; and the recollection of the moral beauty of what I there witnessed will remain riveted on my memory for ever.

THE TANNIER.

From the Southern Agriculturist.

The tannier is a delicate and excellent substitute for the potato, possessing some advantages over the sweet and Irish. It can be eaten with impunity by those who dare not touch potatoes; they will keep better also, and are good throughout the summer. This plant was known and valued by the ancients, who used both the leaves and roots. There is little doubt of its having been introduced into the West Indies, at their early settlement by the Portuguese and Spaniards, and into South Carolina from Jamaica.

It was classed by the early botanists among the Arums, as will appear by a reference to Linnæus and Miller; but the moderns, (as I am informed,) place it among the Caladiums. Sloan, in his History of Jamaica, mentions it as *Arum Maximum Egyptiacum*, and says, it was brought into Portugal from Africa, where it grows wild—that the slaves love it very much—that the hippopotamus lives on its roots, in Egypt—and the people feed on it as we do on turnips. Tayas or eddoes are eaten in Jamaica, and cause a heat in the throat, called scratching of the throat, and therefore only eaten by negroes. Sloan gives a very interesting account of this plant.

At the early settlement of Carolina, many negroes were brought into it from Jamaica, and no doubt by them it was introduced. The name tannier is derived from Tayas, (for in the course of my researches on the subject, I can find the word only in Dr. Willich's Domestic Encyclopædia, and Mr. Webster's new Dictionary;) the former under the word eddoes, says, "another variety of the tannier, both these resemble each other, except that eddoes, are smaller, more acid, and require longer boiling than tanniers—they are planted in South Carolina"—and goes on to give some account of the mode of culture, &c.

I would beg leave to refer the reader for his amusement, to 1st vol. Sloan's Jamaica, p. 166, and 2d vol. p. 367— also Willich's Domestic Encyclopædia, (read eddoes,)—Rees' Cyclopædia, (title Arum.) Webster must have got the word tannier from Willich. See also Curtis's Botanical Magazine, vol. 21, No. 832, read Calla Ætheopica, a colored representation of leaf and blossom, from the production of an English hot-house. It is a perfect dwarf, compared to the production of our fields, which are magnificent and beautiful, the leaves often measuring three feet in length and two feet in width, of a perfect green color and velvet softness, and a leaf stalk three feet long and an inch in thickness.

Catesby in his 2d vol. p. 45, gives also a colored representation, in miniature, and says, "A little before I left Carolina (100 years ago,) there was introduced a new kind, wholly without that bad quality (scratching the throat) and requiring no

more than common time to boil, and may be eaten raw without offending the throat; this was a welcome improvement among the negroes, and was esteemed a blessing, they being delighted with all their African food, particularly this, which a great part of Africa subsists on."

I will now give you my *method of cultivation.* Time of planting from the middle of March to the first of May—soil rich and loose—neither too high and dry, or too low and wet. Where old hog pens have been, answer well; at all events the ground should be well manured to ensure a good crop; after the ground has been well dug up and levelled, make up hills three feet apart every way, or four feet if the ground is very rich, the hills not to be as large or as high as potato hills. If you have no small tanniers, take the larger ones, slice off the top or crown part about an inch thick, and quarter the remainder lengthwise, making five pieces from each; plant one small tannier, or one of the cut pieces (cut side down,) in the middle of each hill, about five inches deep—when up, and two leaves unfolded, haul up the earth to them and hoe the grass between the hills—three times hauling up will be sufficient, as the leaves soon prevent the further use of the hoe—nothing more will be required until harvest.

As soon in October or November as the leaves indicate a smart frost, cut them off about a foot from the hill, and dig up the roots carefully, expose them to the sun and air all day, at night pile them up and cover them lightly with the leaves, or put them into the barn, first shaking off as much of the dirt as you can—in a few days you will find the stems of the leaves soft and rotting—you must then pare them off close to the root—trim off the fibrous roots—put them in your potato house, or other close place—separating the larger for use, and the smaller for the next year's planting; no vegetable is more easily cultivated, nor keeps better throughout the year.

The tannier should always be pealed before boiling, and the large roots cut into two or three parts, and three hours boiling will be sufficient.

WILLIAM LOGAN.

ACCOUNT OF 'FIVE HUNDRED POINTES OF GOOD HUSBANDRIE,' &c.

By THOMAS TUSSER, Gent. first published in 1652.

From the [Edinburgh] Farmers' Magazine.

Sir—The valuable papers in your Magazine, entitled, 'View of the Progress of Agriculture in Great Britain,' seem to have induced some of your correspondents to peruse the works of our earliest writers on rural affairs, which formerly had been thought unworthy of notice. It may excite surprise, in this book-making age, that the number of British agricultural publications, prior to 1700, should be comparatively so very limited, and that none should be known to have existed prior to 1534. There appear to have been a few French translations circulated before this period; but history assures us, that Fitz-Herbert is the first English author who wrote expressly on husbandry; and hence he has been frequently styled the Father of husbandry.

In perusing the earliest writings on husbandry, it is not to be expected that the modern agriculturist is to derive much professional information. But certainly it is both pleasing and interesting to know the ancient state of agriculture, and the successive improvements it underwent. I therefore cordially approve of the plan you have adopted of giving a short view of the leading doctrines taught in our early works on that subject; and cannot help thinking, that a new edition should be published of the greater number of them.

The object of the present communication is to give an account of the 'Five Hundred Pointes of Good Husbandrie,' &c. by Thomas Tusser, somewhat more full than is exhibited in the 'View of the Progress of Agriculture in Great Britain.' This book was published in 1562, and has gone through several editions. The one before me is dated 1580. It is written in rhyme, but cannot, in general, boast of the beauties of poetry. It contains much extraneous matter, particularly on religious subjects, a custom then very prevalent. But it has always been considered as containing a pretty faithful view of the state of agriculture at the time it was written.

It appears, from Epistles to Lords Paget, father and son, and from an article with the title of the 'Author's Life,' that Tusser was born of a good family at Rivenhall, in Essex; received a liberal education; went to Court, where he seems to have been patronized by Lord Paget, and, for ten years, lived as other thoughtless young men do. He then married, and retired to Suffolk, where he seems to have engaged in agriculture rather from necessity than choice. It was here he first formed the plan of his Book; though, at this time, he does not appear to have had any high idea of the profession.

'As in this booke, who list to looke,
Of husbandrie, and huswiferie,
There may he find more of my minde
Concerning this:
To carke & care, and ever bare,
With losse and paine, to little gaine,
All this to have, to cram Sir Knave
What life it is.'

He did not live long in Suffolk, and indeed seems to have been too restless a person to remain long in any situation. After many vicissitudes, the last notice of him is, that he fled from London during the Plague, and settled at Cambridge, and probably obtained some appointment in Trinity College, where he had completed his education. In his early years, he had been a singing-boy in a cathedral, and probably now turned his musical talents to some account; for, among other shifts 'to help to live,' he says,

'Let musicke win, let stocke come in.'

He seems to have been altogether a very eccentric sort of person, but withal, at least in his latter days, remarkably devout and repentant, and very anxious to put young people on their guard against the follies in which he had himself once indulged.

The Booke of Husbandrie before us, after 14 chapters of preliminary matter, complimentary, quaint, and somewhat dolorous, begins with September, and proceeds in regular succession, through all the other months of the year, though the observations on the operations proper for that month, are not supposed to commence till Michaelmas, the term of entry to farms in England; and the observations in August are to be understood as extending to that period.

Instead of following our author's plan, we shall give a short view of some of the courses of management he recommends. This will enable our readers to perceive more clearly the justness of his doctrines. We may first take notice of the agricultural implements then in use. A description of these is given in September, the beginning of the English farmer's year under the title of 'a digression to husbandry furniture.' Barn utensils are first enumerated, which need not be minutely detailed; though upon a reference to the book itself, they will be found to have been complete for the time. The two chief utensils are, however, wanting—the fanners and thrashing machine. The stable utensils are next adverted to; and then follows a description of the implements more immediately connected with field operations. Both these inventories contain hints which may be found instructive even to the farmer of the present day. The plough, harrows, and roller then in use, are merely named; so no opinion can be given of their construction or fitness for use. In regard to the first, it appears that both chain and swing-ploughs were employed; and our author recommends

'Two ploughs and a plough cheine, 2 culters 3 shares,
With groundclouts and sideclouts for soile that so tares.'

Horses and oxen are stated generally to have been employed in agriculture; but nothing is said regarding their comparative utility. He however recommends, with great propriety, that oxen to be used in draught be kept in good condition, and well shod. In regard to summer-fallowing, he recommends that it receive the first ploughing in January, the second in May, and the third in July; after which to harrow it, and let it remain in that state till it shall be found convenient to 'composse' (dung) it, when it is to be laid up, by which must be meant a fourth and last ploughing. With this treatment the fallow could not be properly cleaned, the weeds having been allowed to grow from May to July; but as cultivated herbage does not seem to have been then introduced, this was probably thought profitable management in the circumstances of the case. We shall take the liberty of quoting our author's sentiments on this subject.

'JANUARY.

'Who breaketh up timely his fallow or ley,
sets forward his husbandrie many a way.
This timely wel ended doth forwardly bring
not only thy tillage, but all other thing.

'MAY.

'In Maie at the farthest, twifallow thy land,
Much drout may else after cause plough for to stand.
This tilth being done, ye have passed the wurst,
then after who ploweth, plow thou with the furst.

'AUGUST.

'Thy fallow once ended, go strike by and by
both wheatland and barlie, and so let it lie:
And as ye haue leisure go composse the same,
When up ye do lay it more fruitful to frame.'

It does not appear that any drilled crops were cultivated. Turnips are mentioned merely as a garden crop. The crops cultivated are stated to have been—wheat, barley, oats, peas and beans, fitches, rye, flax, hemp and hops. Three varieties of wheat are treated of—white, red and gray. Peas, white and gray, are spoken of as being in common cultivation. No varieties of oats and barley are adverted to. No mention is made of any preparation being given to any particular species of seed to prevent disease in the crop; nor is disease at all spoken of. He recommends early sowing, and the selection of the best qualities for seed; and is very particular in regard to harrowing and drawing of water furrows. Nothing is said of draining, which is rather remarkable. The advice regarding the management of dung in February is incorrect, though too much sanctioned by the practice of later times; but the mode of applying it is judicious, and too little attended to in the present day. On these subjects we shall quote our author's words—

'Who laieth on doong er he laieth on plow,
such husbandry useth as thrift doth allow,
One month er ye spred it, so still let it stand,
er ever to plow it, ye take it in hand.
'Place doong heape alow, by the furrough along,
where water all winter time did it much wrong;
So make ye the land to be lustie and fat,
and corne thereon sown to be better for that.'

But it must be observed, that the dung, applied at other periods of the year, is recommended to be covered in as soon as convenient; and some judicious hints are given in regard to collecting it. The author is silent on the subject of leases, as well as on that of serfs or bondsmen. The latter had probably been all emancipated before his time, and the former were perhaps very rare.

Soils are not particularly treated of. All that is said of them regards their adaptation for particular crops. The author's sentiments on this subject shall be extracted.

'Each soil hath no liking of every grain,
nor barlie and wheat is for every vaine.
Yet know I no countrie so barren of soile,
but some kind of corn may be gotten with toile.
'As gravel and sand, is for rie and not wheat,
(or yieldeth her burthen, to tone the more great)
So peasen and barlie, delight not in sand,
but rather in claie, or in rottener land.
'Gray wheat is the grossest yet good for the clai,
though woorst for the market, as fermer may say.'

The mode of cropping enjoined in the Booke of Husbandrie is, in general agreeable to the rule which regulates modern practice. Two successive white crops are not recommended; but alternate white and pulse crops, or fallow, are directed to be taken as the most advantageous. We cannot do our author greater justice than by quoting his own words on this subject; from which it will appear, that his mode of cropping was, in the circumstances of the times, not only preferable to the plans of cotemporary writers, but the best that can be conceived in regard to the arrangement of the crops then cultivated.

'Otes, rie, or else barlie, and wheat that is gray,
brings land out of comfort, and soon to decay;
One after another, no comfort between,
is crop upon crop, as will quickly be seen.
'Still crop upon crop many farmers do take,
and reap little profit for greedines sake;
Though breadcorne and drinkcorne, such croppers do [stand,
count peason or brank, as a comfort to land.
'Some useth at first a good fallow to make,
to sow thereon barlie, the better to take;
Next that to sow pease, and of that to sowe wheat;
then fallow again, or lie lay for thy neat.
'Where rie or else wheat, either barlie you sow,
let codware be next thereupon for to grow.
Thus having two crops, whereof codware is ton,
thou hast the less need to lay cost thereupon.

'Two crops of a fallow enricheth the plough,
though tone be of pease, it is land good enough.
One crop and a fallow some soile will abide;
where, if you go furder, lay profit aside.'

A number of sensible remarks are also made regarding the weeding, harvesting, thrashing, and disposing of the respective crops, some of which were applicable only to the then existing state of things; but others deserve attention at present.

The benefit of enclosures was duly appreciated by Mr. Tusser; and the importance of this measure was rendered doubly great, from the circumstance of many of the possessors of open lands being at that time not very scrupulous in observing the line of their marches. In reference to which he says,

'The country enclosed I praise,
the tother delighteth not me.

'More plenty of mutton and beefe,
corn, butter, and cheese of the best;
More wealth any where, (to be briefe)
more people, more handsome and prest,
Where finde ye? (go search any coast)
than there where enclosure is most.

'More profit is quieter found
(where pastures in severall be)
Of one silly aker of ground,
than champion maketh of three.
Again, what a joy is it known
when men may be bold of their own?'

A number of good observations are to be found regarding the treatment of Live Stock, which it may be unnecsessary to exhibit in detail. It may, however, be proper to take notice of the very ill judged, and, in many instances, ruinous practice which then prevailed, of milking ewes for too long a period after weaning their lambs. Yet experience has not been found so convincing as to abolish this reprehensible measure in the present day, although some have suffered severely by it. Our author says,

'At Lammas leave milking for fear of a thing,
least *requiem aeternam* in winter they sing.'

Throughout the Booke are dispersed many observations on gardening, addressed to the housewife; from which it appears that Tusser considered the culture of the garden as her peculiar province. Upon this we shall also say, that if the ladies of the present day were to undertake this charge, it would at least put to silence the well known proverb, that good farmers are always bad gardeners.

VETERINARY PRACTICE.

From the British Farmers' Magazine.

An operation of an unusual description, and attended with great success, was lately performed by our townsman, Mr. J. Barrett, veterinary surgeon,on a valuable cow belonging to Robert Winslow, Esq. of Wilton, Somerset. The removal of the sub-maxillary sparrotted gland, commonly called wen, which had been increasing in size beneath the lower jaw, for the two past years, and for the last two months appeared to endanger the life of the animal from suffocation and starvation, occasioned by its extreme pressure on the windpipe. The incision that was necessarily made on the part, measured twelve inches: and an arduous dissection was then necessary on account of the adhesion of the glands, and the nicest precision was required in separating the inferior maxillary artery, as well as the jugular vein; but the hæmorrhage was inconsiderable. The relief afforded the animal was instantly apparent, and truly gratifying to those who saw the operation. The animal is now quite well, and much improved in condition and appearance. The gland weighed five pounds. The improvements daily making in veterinary practice must be highly satisfactory to gentlemen possessing valuable animals; and the advancement of this branch of science, which has been so many years neglected and left in unskilful hands, promises very desirable benefits to society.

PECULIAR BREED OF SHEEP IN THE NEPAL COUNTRY.

The huniah is a large tall breed, with slender, compressed, spirally-twisted horns, and short narrow tail. Though now naturalized in the Kachar, it is of trans-Hismalayan origin. The color is almost invariably white. Individuals of this species are apt to have three, four, and even five horns. The huniah cannot bear the heat of Nepal south of the northern division, and will doubtless flourish in England, where the experiment is making of naturalizing it. Its wool is supurb.—*Journal of the Asiatic Society of Bengal.*

ADULTERATION OF MILK.

From the Edinburgh Medical and Surgical Journal.

The subject of the adulteration of milk has been lately investigated with great care, by M. Barruel of Paris. Although his observations are intended to apply only to the milk of that city, yet there is little doubt that they will also be found applicable in a greater or less degree to all great towns. He sets out with stating that all instruments for ascertaining the purity of milk, which are calculated to attain this end by pointing out differences in its density or specific gravity, are inaccurate and useless. For, on the one hand, pure milk differs much in density, according to the fodder used by the dairy-man for his cows, the butyraceous matter which imparts lowness of density, being made to preponderate by some sorts of food, and the caseous part, which increases the density, being made preponderant by other sorts. And, on the other hand,although water, the ordinary substance with which milk is adulterated by the dealers in the French capital, would alone cause a great diminution of density, the dealers know very well how to prevent that effect, and so render the areometer useless. For this purpose, it is only necessary to dissolve in the milk a little sugar-candy, which is required at all events in order to correct the flat taste imparted to milk by diluting it with water. The result of M. Barruel's inquiries on the adulteration of milk in Paris, is, that no positively noxious substance is ever to be found in it; that a common practice is to remove a considerable portion of the cream, by allowing the milk to stand for a limited time, and then to dilute the remainder, or skimmed milk, with water, and to give it the apparent qualities of new milk in one or other of the manners now to be mentioned. The opacity of the milk being much diminished by the water, so that the milk acquired a blueish appearance, it was at one time usual to correct this defect, by previously mixing wheat-flour with

the water with which the milk was diluted. But this adulteration was too obvious to the senses. Any person even of indifferent delicacy of palate, could detect the altered taste of the milk; and besides, after too hours' rest, the flour sank to the bottom, restoring the translucent blueness of the milk, and pointing out the nature of the fraud. To prevent this inconvenience, the dealers boiled the flour in the water before mixing it with the milk; and in this way an opaque mixture was procured, which retained its opacity on standing. As even with this addition the fabricated liquid had a flat taste, sugar or sugar-candy was dissolved in it, by which means the peculiar sweetness of the milk was partly restored. This adulteration, however, has become so easy of detection by means of iodine, which renders the mixture blue by its action on the fecula of the flour, that M. Barruel believes that the fraud now described is very little practised in the present day at Paris. In Britain, where the municipalities take no charge whatever of the purity of this most important article of food, it may be presumed that the adulteration with flour, sugar, and water is common enough, as it is a simple and cheap mode of accomplishing every purpose of the fraudulent dealer. The best mode of proving the presence of farinaceous matter in such mixtures, is to heat the milk with a little sulphuric acid, to coagulate the casein, to filter the whey, and then to add to the latter the tincture of iodine; upon which a fine blue color will be struck. Driven from this species of adulteration, the Parisian dealers have latterly resorted to another so ingenious, that M. Barruel conceives they could not have discovered it, without the aid of some scientific person. The method is simple, so cheap, that for ten-pence the opacity and color of the milk may be imparted to thirty English pints of water, and so far secret that no disagreeable taste is communicated. This is nothing more than the employment of an emulsion of almonds, for which some dealers, more greedy and less cautious than the rest, have substituted hemp-seed, which however, is apt to impart an acrid taste. By either of these means the milk may be diluted to an indefinite extent; and the only corrective required is a little sugar-candy to remove the flat taste. A peculiar advantage possessed by this mode of adulteration over every other is, that the vegeto-animal matter or vegeble albumen of the emulsion by which the oil of almond is held in suspension, is coagulated, or curdled, like casein, by acids. The method recommended by M. Barruel for detecting the fraud is founded on two circumstances,—the greatly inferior quantity of coagulum formed by acids in the mixture of milk and almond emulsion, compared with that formed in milk alone, and the facility with which, by kneading the coagulum with the fingers, oil may be squeezed out of the former, while none exists in the latter. On examining carefully four different specimens of pure milk, procured from different quarters in Paris he found that 300 parts of each, coagulated by heating them with an equal volume of vinegar, gave each a quantity of curd, which, when well drained, and equally pressed between folds of bibulous paper weighed 29 parts; and that the same quantity of milk taken from a cow in presence of a person sent to procure it, gave 30 parts of curd. He then found, that when the same milk was mixed with various portions of water, the quantity of curd was exactly in the inverse ratio of the proportion of water added. The water, therefore, did not prevent any portion of the curd from being thrown down by the usual modes of curdling the milk. He next found, that, if a given quantity of sugar was added to the mixture of milk and water, the quantity added could be separated exactly by evaporating the whey to the consistence of an extract, heating this with alcohol, filtering the alcoholic solution, and evaporating to dryness. He then also found, when equal parts of almond emulsion and milk were mixed together, 300 parts of the mixture, curdled by vinegar as above, gave 16½ parts of curd; and that the same quantity of mixture containing two parts of emulsion to one of milk, gave only 10 4-5th parts of curd. So that although, as was to be expected, the adulteration with almond emulsion did not lessen the quantity of curd to the same extent as adulteration with water only, yet the decrease was very great, and very nearly in the ratio of the quantity of emulsion added. Lastly, on placing pure curd on white paper, no oily matter was thrown out; but the curd procured from the mixture of milk and almond emulsion, besides being less firm than the former, gave out in 24 or 48 hours, a quantity of oil sufficient to stain the paper. Another adulteration to which milk is subjected in Paris, is with carbonate of potass or soda. The object of this variety of adulteration is, in the hot summer months, to prevent the milk from becoming sour and curdling, or to break down the curd and correct ascescency when the milk has actually become spoiled. In this process, acetate of potass or soda is formed. Neither of these salts, in moderate quantity, is injurious to the health; indeed, acetate of potass exists naturally in milk, and is the source of some embarrassment in the detection of the present fraud. The mode of analysis adopted by M. Barruel is as follows:—As the alkaline acetates are converted by incineration into carbonates, he endeavored, by means of this property, to ascertain the quantity of alkali naturally contained in whey. He therefore, evaporated a certain quantity of whey to dryness, incinerated the residue in a platinum crucible, and procured an alkaline ley from the remainder, which by the process recommended by Decroisil, for measuring the strength of alkaline fluids, indicated from one and a half to two degrees of alkalinity. Hence any increase of alkaline strength above the last of these points, must be considered as owing to the intentional addition of carbonate of potass or soda. This is evidently the most difficult of the processes recommended for detecting the various adulterations specified in M. Barruel's paper. Indeed a chemist alone could conduct it. The others may be easily executed by any body.

CANADA THISTLES.

From the Genesee Farmer.

I have recently noticed in the Genesee Farmer several articles on the destruction of the Canada thistle; but none of them seem to reach the *root* of the evil. I am, however, pleased to see the public attention drawn to the subject.

The extermination of this pest of our plough fields, is an object of great importance to all farmers, who are unfortunate enough to have them on

their lands; and it is therefore, in a measure, incumbent on them to communicate to each other whatever methods they have taken for that purpose, and particularly such as have had the desired effect.

I have no expectation that this thistle is to be totally and entirely eradicated, and banished from the country, as it is a perennial plant, and is to be found on the road sides, in woods, and in all unoccupied lands, (at least in this vicinity.) All that can be done with such, if near at hand, is to cut them off and prevent their seeding. But being possessed of another manner of propagating themselves, more sure and certain, by their side or horizontal roots, which the cutting of the tops of the plant does not effect or check; they therefore must be permitted to remain, in such places, by a sort of compromise, that they are to be prevented from scattering their seeds on to our plough fields, from which I am confident they may be expelled, and after which, easily kept out; any further than this I shall not attempt doing or advise others to do.

Some enactments of the legislature, as recommended in the Farmer, would undoubtedly be of use. Such as obliging the owners of land (at least such as is under improvement,) to cut them at the proper time—imposing a penalty for neglect—and making it the duty of overseers of highways to have this done on the margin of roads. It would likewise have the effect of calling the public attention to the thing, and spread the alarm.

In articles of this sort, intended to guide the operations of others, unless one goes somewhat into detail, the object is in a measure lost; for those (if any there should be) who may be induced to adopt the method recommended, will have a wish to know all the particulars of the process before they commence. I shall therefore be compelled to make this of greater length than I supposed at first setting out would be necessary. What is here stated, however, is all from my own knowledge; nothing is given on hearsay.

When I purchased the farm which I now occupy, about thirty years ago, excepting some meadow lands, near a river, and some other small pieces, there were little or no improvements on it; being thrown out to commons, and mostly covered with small sapling wood and bushes—or as my Dutch neighbors expressed it, "*it had run out to bush.*" In open spots in this *bush*, the Canada thistle was sprinkled pretty liberally; and after clearing and ploughing they began to spread to an alarming extent, and threatened to overrun the whole premises. This first led me (but not in time by many years) to adopt some method more effectual than cutting off the tops to stop their progress.

It is well known to all farmers as well as botanists, that the roots of no tree or plant, whether annual, biennial, or perennial, can long survive, if prevented from vegetating, and coming up to the light of day. My theory was based on this principle. I commenced operations about eight years ago, on some small patches in a field planted with corn, as soon as any thistles appeared after planting, cutting them off twice a week at first; and was very particular never to have it neglected. It would take but a few moments to go over a patch two or three rods square, with a hoe; at the same time being very careful to leave none: and to be sure of this I generally went over the ground, row by row, a second time. The deeper they are cut off with the corner of the hoe, the longer time of course it will require the new shoots to reach the surface again. I followed them up in this way, and about the middle of August they began to come up thin and scattering, and appeared of a sickly, yellowish hue. This was encouraging, and we continued the operation, (though I found it was not necessary to look to them quite as often as at first,) to about the first of October, or until no more appeared, and none have since shown themselves on these spots.

By digging down to the main roots in August or September, they were found in a state of decay, being of a blackish color. The result of this first attempt, is already given; but I will give something more of the details of the operation. That there should be no difficulty in finding the several patches when the corn had attained its full height, I placed high poles at each spot so that they could be seen over the tops of the corn, and kept a hoe on the ground to be ready at hand whenever I happened, in walking over my premises, to take them in my way, and cut them off if any were to be seen. In this way, but little time was spent; in fact none worth noticing. And as early as the first of October, as before observed, they were completely conquered. I ascribe the early season at which these patches were subdued, to their being allowed no breathing spell, and no omission being made through the season of operation, of cutting them off as fast as they appeared.

I have sometimes in lieu of, or rather for the want of a hoe, used a piece of hard wood, flattened to two or three inches wide at one end, and sharpened; or what is still better, a piece of iron or steel, like a chisel, fastened to the end of a stick or walking cane. It is proper to have some kind of tool in hand, or at the spot, otherwise some might escape, when one was accidentally passing near them.

Although the actual labor and time spent to destroy thistles in this way, is but trifling, at least in small patches; still it requires considerable patience and much diligence, that the thing may never on any account be neglected during the season of their growth; and I would caution all such as may have an inclination to try the experiment, that unless they are fully determined to persevere, and have full confidence that they can do it for at least four months, not to attempt it; because by any neglect during the season, the previous time spent, is in part lost; as by allowing the plants a breathing spell in the sun and air, new life and vigor is communicated to the roots, which is the thing intended to be destroyed.

As an evidence of this, in the season of 1828, I undertook to kill the thistles on a field of about fifteen acres planted with corn; and on which there were nearly twenty patches. Having placed the poles as before, I began cutting them as soon as any appeared after planting. They were followed up without any neglect, and as fast as they appeared, until about the 20th of August, when they appeared nearly subdued, or in a fair way for it, beginning to come up scattering and yellow. At this time I was called away on a journey, and was absent nearly four weeks, leaving strict injunctions on my men not to neglect the thistles in my absence. How far they attended to it, I cannot say, for immediately on my return, I was

taken sick, and was confined until after corn harvest. The thistles of course were forgotten. To make the matter still worse, the ground instead of being planted again as it should have been, was sown with barley and peas, and in September following with wheat, and the next spring stocked with clover for pasture. The same patches of thistles having revived, began to show themselves on the barley and peas, but being few in number and scattering, no attention was paid them. They have since continued to increase and spread by their horizontal roots, so that there is nearly or quite as many on the field as at first; although they have been regularly mowed off every year, and sometimes a second time, and have not seeded. This failure was evidently owing to the business not being attended to as it should have been the latter part of the season; but might have been remedied had the ground been planted with corn the second year, and which I shall do soon, and hope to avoid a like neglect, by which our labor in experimenting this season was lost.

The season of 1830, I planted another field with corn of about the same size of the last mentioned. There were on this field a number of patches of the thistle, some of them large, say over half an acre, some small. It was calculated that altogether they would have covered two and a half acres of ground. Having as usual marked the spots with poles stuck in the ground, we commenced cutting them at the proper time. The labor required on this field was more than on any I had yet taken in hand—the patches being large, and the thistles thick and strong. At first, and while vegetation was quick and rapid, the labor to go over them was equal to two men a day; but in a short time one man would do it in the same time, and towards the close of summer in three or four hours. Some of these patches were obstinate, so that we were obliged to follow them up into October; others gave up sooner. On the whole, they were totally destroyed. None escaped, and none are now to be found in any part of the field that has been ploughed. Although we succeeded in destroying the thistle on this field the first year, I should advise, where killing them is the great object, to plant with corn two years in succession, (although this in other cases might be bad management,) that should any thistles escape the first, they may be finished the second year.

I cannot state the expense of this experiment, as I kept no memorandum; but should think it would amount to not more than twenty dollars, if men had been hired for that express work; but as it was done mostly by boys, with myself, or some careful hand to overlook, I paid out nothing extra for labor that season on account of this job, and there was no neglect of other farming operations. But twenty or even forty dollars, would be nothing compared with the object attained, by clearing a good plough field of this nuisance. Had they been left to their natural course, they would in a few years by the running of their horizontal roots, and scattering with the plough and harrow, have spread over the whole field and ruined it for tillage.

The last season I planted with corn a small piece of about four and a half acres, much infested with thistles. It was planted with the express view of killing them—they were spread over a great part of the ground, but were small, the land having lain in pasture twelve years without ploughing, and had become what is termed sward-bound, which checks the growth, although it does not kill the thistle. The same course was pursued as in former years, and the business was well and regularly attended to. But few appeared after the first of September, but they were not neglected as long as one was to be found. I think they are all destroyed; but to make the thing doubly sure, I intend to have it planted next season.

A small piece at one end o this ground was planted with potatoes, on which I had never noticed any thistles. They however made their appearance, and were cut off with the rest. But when the tops of the potatoes began to fall on and cover the ground, it was with difficulty that the thistles could be found, and probably enough has escaped to keep the roots alive, and more or less will make their appearance another year. I therefore would advise never to plant potatoes where, and when, the great object is to destroy the thistle. On another account, I consider corn much the best crop to plant with this view. The roots of this plant, if it grows strong, run through and fill the ground with small fibres, which has a tendency to keep the ground dry and hard; at the same time the tops form a shade, and altogether seem to have the effect of checking the growth of the thistle, and aid in the operation of destroying it.

To prevent the necessity of going over the ground as often as was required with the hoe, I last spring had made some iron tools not unlike a small light crowbar, flattened at the lower end to about a hand's breadth and length, and steeled. With this tool, in soft mellow ground, the thistle may be taken up to the depth of six to twelve inches; but the process is much slower, and perhaps the time employed in killing them in this way, although the operation is not so often to be performed, is equal to doing it with a hoe, with which the ground is much quicker gone over.

The horizontal root of this plant, so often mentioned as its principal instrument of propagation, will be found at various depths, according to soil. In lands under the plough, and in other rich mellow ground, they push themselves along, in every direction from the main patch, and at every few inches send up a branch to the surface. On carefully uncovering a space several feet square, I have found them in a matter connected and tied together with this root. Whenever they can be taken up below the horizontal root, they are mostly destroyed with once going over, and with the iron tool before described, this is frequently done; and where there may be a very small patch in a distant field, the inconvenience of looking to it as often as would be necessary with a hoe, might be avoided by taking this course. In wet rainy seasons, like the last two, I find they spread themselves much faster than in dry ones. The ground being soft, and the roots strong and vigorous, and meeting less resistance, they will push along a considerable distance in one summer.

About nine years since, I had made a string of half stone fence, with posts, and boards on top. The ground on which the wall was placed, was rich bottom, and was set there to withstand the spring floods. It was made on the line of one of my neighbor's land, on which at a small distance was a large patch of Canada thistles. In a short time they pushed along and reached the wall, and have run along in, and under it, more than thirty rods,

or fifteen each way, in about seven years. Having heard that salt and strong brine would kill them, I procured, three years ago, a quantity taken from fish barrels, and taking off the top stones of the wall so as to come nearer the roots, the brine and salt was put on very bountifully. It had the effect of killing the tops of the thistles, and wilted them down; but the next summer they came up through the wall as thrifty as before. I see no remedy in a case like this, but to remove the wall, otherwise they will travel to each end of it, and from this lodgment spread over the adjoining field. And I have no doubt, that if a strip of rich, mellow land, reaching a distance of twenty miles, could be had, unobstructed by rivers, swamps, &c. a low stone wall placed thereon, and a family of thistles set a going at one end, but that they would in course of time, reach the other, and without the agency of any seed.

On my mowing and pasture lands, such as are wet and never ploughed, there are some patches of the thistle; which have for twenty-five years past remained nearly stationary. They are always mowed off in July, before the seed is ripe, and if necessary a second time to prevent their seeding. In this kind of hard sward land, they are small and puny, and comparatively give but small trouble and annoyance.

Whenever we have succeeded in expelling the thistle from our tillage lands, which is the extent of my expectations, in respect to my own, and all that I would at present advise others to attempt doing, they may, I am confident, with little care and no expense, be easily kept off afterwards. The seedling thistle is very small, and as easily destroyed as a pigweed, should they happen to be observed. It requires several years for them to form any considerable patch—their greatest security is their not being noticed, until by their side or horizontal roots they have run out in different directions. Small patches may be killed by a deep covering of any thing that will keep them under, and prevent them from shooting up to the surface. This I have done with pomace put on to some very small bunches near my cider mill. Salting cattle and sheep often on small pieces, will have the like effect; but this must be done very often, and through the season of growing. The salt itself does not have the effect of destroying the roots, because it cannot reach them, but the frequent licking of the spot by the cattle takes off the shoots as fast as they come above the ground, which is the same in its effects, as hoeing them off. All these methods, however, cannot be practised except on a very small scale.

I know of no plant or bush, with which the Canada thistle so nearly compares in its habits and modes of propagation, as the common elder. This, like the thistle, has its seed, and its horizontal roots with which to form patches; and like it, also, in not being to be destroyed by cutting off the tops once, or even twice a year, but must be rooted out. The same treatment which kills the thistle would have the like effect on the elder; but this would be attended with too much trouble, for the small number usually on our farms,—the better way, therefore, is to dig and root them out at once. But I think it is as great an absurdity for a farmer to say that he will not attempt to destroy the clumps of elder on his mowing land, because his neighbor lets them alone to seed, as to refuse to kill the thistle on his plough land for the like cause. Since in either case, when they are once eradicated, they are easily kept out, let his neighbor's practice be what it may.

In my various experiments, I have tested this method of destroying the thistle sufficiently to convince myself at least, that it is very practicable, and attended with but little expense, if pursued with due care and perseverance. If no failures had happened in my several and yearly attempts, another year would have completed the routine of my ploughing fields, but it will now take three—and as I am less than that, from three score and ten, and have a wish to complete what I have undertaken, I must be careful to avoid the like errors in future. I close this long article with the hope that it may be of use, by inducing some of my brother farmers, who have a good stock of resolution and perseverance, and a plenty of Canada thistles on their land, to try the experiment, at first, if they please, on a small scale. I shall be pleased to be informed of the results, and particularly of their success. In the interim, I would inform them that I have allotted and set off for the ensuing year, a pretty large job of the same sort. The ground on two fields being already once ploughed for corn, on which there are patches of thistles in plenty, enough to cover three and a half or four acres, of which, provided my health is spared, I hope to be able to give a good account at the close of another year.

A SUBSCRIBER.

Note.—I would add one more remark, that no grass or weeds of any kind, must be permitted to grow on the spots or patches during the season of the operation, as they conceal the thistle sprouts, which may consequently escape the hoe. I have usually, on the spots where the thistles were thick and intermixed with weeds, hoed the ground well all over, as often as was necessary to destroy the weeds, and at the same time the thistle was taken off also.

TABLE

Showing the velocity of the wind in different circumstances.

Miles per hour.	Feet per second.	Perpendicular force on square feet, in averdupois pounds and parts.	
1	1.47	.005	hardly perceptible—
2	2.93	.020	just perceptible.
3	4. 4	.044	
4	5.87	.079	gently pleasant.
5	7.33	.123	
10	14.67	.492	pleasantly brisk.
15	22.	1.107	
20	29.34	1.968	very brisk.
25	36.67	3.075	
30	44.01	4.429	high wind,
35	51.34	6.027	
40	58.68	7,873	very high wind.
45	66.01	9.963	
50	73.35	12.300	storm or tempest.
60	88.02	17.715	great storm.
80	117.36	31.490	hurricane.
100	146.7	49,200	hurricane that tears up trees and carries buildings before it.

PLAIN DIRECTIONS FOR ANALYZING GYPSUM.

For the Farmers' Register.

It is not quite so easy to analyze gypsum, and ascertain the precise proportions of any foreign admixtures, as may be done with marl. Still it is not difficult, nor very troublesome, to go through such a process as will enable any farmer to avoid being deceived by any adulteration of gypsum offered for sale. In the pulverized state, as prepared for manure, it is impossible to detect the grossest and most injurious fraud, by merely the appearance or taste, or by handling the article. If chalk, and very white clay, (such as forms some of the subsoils in Nelson county) were used to make half the weight of what is sold for gypsum, it would scarcely be detected—and many farmers might be cheated with a mixture containing not even the smallest proportion of gypsum. I know not whether such frauds are attempted—(and the character of the mills in Virginia is enough to guarantee the purity of *their* ground gypsum—) but if attempted, there is nothing whatever to prevent their succeeding, unless chemical tests are employed for detection. The inspectors of gypsum appointed by law, who, it is to be presumed, judge altogether by the appearance, and other sensible qualities, are no safeguard against deception; and this particular branch of the inspection system, is even more useless, more deceptious, and operating more as a cheat upon the community, than the inspection of any other commodity whatever. I mean not to reflect on any individuals by these remarks: the fault is in the system, and not in the persons appointed to carry it into operation But this is wandering from my subject.

Not being entitled to be considered either an operative or scientific chemist, I do not know whether a more correct and convenient method of analysis may not be practiced than mine; and there may exist in this, causes to produce inaccurate results, which my ignorance has prevented my discovering. If so, I hope some other person will point out my mistakes.

Gypsum (sulphate of lime) is composed of certain proportions of sulphuric acid, lime, and water, chemically combined. Some small admixtures of metal, &c. which always accompany the gypsum of commerce, are too inconsiderable to affect the value materially, or to be ascertained by the process which will now be directed. Considerable admixtures of substances which could deceive the purchaser of ground gypsum, must be of clay, or chalk. If sand, or silicious earth was contained in gypsum, it would be evident enough to the teeth of the examiner.

1. Let a certain quantity, say 100 grains, of gypsum of commerce be pounded finely, when quite dry, and then tried with muriatic acid, in the manner directed page 609, No. 10, of the Farmers' Register, for analyzing marl. Pure gypsum will not show any effervescence, or other effect, from the application of muriatic acid. But if there is any effervescence, it proceeds from the presence of chalk, or *carbonate of lime*, in some other form: and the proportion of this substance must be ascertained by the directions given in the paper just referred to.

2. Then put into a glass another portion of the same article, say 25 grains, (finely pounded and sifted through muslin, before being weighed,) and pour to it a saturated (or very strong) solution of *carbonate of potash* (which the apothecaries sell under the name of the *super carbonate*.) The two compounds thus placed in contact, *sulphate of lime* and *carbonate of potash*, will decompose each other, and exchange principles in this manner: the sulphuric acid of the first, will leave the lime and combine with the potash of the solution—and the lime will combine with the carbonic acid let loose from the potash: or rather with a part of it—for the lime cannot hold as much carbonic acid as the potash lets go, and the surplus escapes into the air with slow but continued effervescence, which lasts as long as the process is going on.

3. When the effervescence ceases, (which may take some hours, and plenty of time should be allowed,) the chemical qualities of the mixture are totally changed. There no longer remains a particle of sulphate of lime, nor of carbonate of potash, (except the *excess* of the latter, which having nothing to operate on, remains unchanged.) Instead of these, there has been formed the *sulphate of potash*, and the *carbonate of lime*—the former being dissolved in the fluid, and the latter in a solid form at the bottom of the glass. The appearance of the mixture is not perceptibly changed.

4. Pour off the clear fluid, and then add diluted muriatic acid slowly to the solid matter, which (if the gypsum was pure) will dissolve all that is solid (then carbonate of lime) with effervescence. If there was either clay or sand with the gypsum, they will remain at the bottom, after the action of the acid has ceased (as before described in the analysis of marl,) and may be separated by the filtering paper, and after being washed and dried, their weight will show the proportion of such impurities.

Whatever small metallic proportion may be in gypsum, will be dissolved by the acid, and not show in the result (as it should do,) as a part of the impurities. With this small exception, all the remainder of the matter dissolved may be considered as carbonate of lime, and which had been at first sulphate of lime, or pure gypsum, after deducting as much as was dissolved in the first step of the process.

Supposing then that 10 grains of the 100 had been dissolved by the muriatic acid, in the first trial—and that 7 per cent. of solid matter remained after the last, the proportions might be stated as follows:

100 grains of gypsum of commerce consisted of

Carbonate of lime, - -	10 grains.
Clay and sand, - - -	7 "
Pure gypsum, - - - -	83 "
	100

The foregoing proportions would mark very impure, if not adulterated gypsum—though it is not more impure than some I recently tried which was ground at the north. A specimen of the gypsum ground at Haxall's mill in Richmond, contained one per cent. of carbonate of lime only—which very small proportion may perhaps generally accompany the rock, or it might have been an accidental admixture, caused by lime having been landed on the same wharf.

E. R.

JARDIN DES PLANTES.

The *Jardin des Plantes*, at Paris, dates its origin from the beginning of the seventeenth century; but, as a school of botany and vegetable culture, was made what it is by the late Prof. Thouin, during the first years of the consulship. Speaking with reference only to what concerns plants and their culture, this garden is unquestionably the first establishment of the kind in Europe. We have in Britain several botanic gardens, but none maintained for the same objects as that of Paris. These objects are two: first, to collect useful or remarkable plants from every part of the world, and to distribute them to every part of France, and, as far as practicable, to every other country; and secondly, to form a perpetual school of botany and vegetable culture. Plants are brought to the Paris garden from all countries, by a universal correspondence, by particular naturalists sent out at the expense of the nation, and by the general protection and favor of government to the objects of science and the pursuits of scientific men. Objects of natural history destined for the Paris garden, in whatever description of vessels they may arrive in a French port, pay no entrance duty, and they are mostly forwarded by government conveyances to Paris free of expense. Every warlike, exploring, or commercial expedition is accompanied by naturalists officially appointed or voluntarily admitted, to whom every facility is afforded in the objects of their pursuit. Plants received in the Paris garden are propagated without loss of time, and distributed in the first place, to all the botanic gardens of France, of which there is at least one in the capital of every department; next, seeds or plants are sent to such of the colonies as it is supposed may profit most from them; and, lastly, they are sent to foreign correspondents, in proportion to similar favors received, or returns expected. The departmental botanic gardens propagate with all rapidity the plants received from the central garden, and distribute them among the eminent proprietors and cultivators of the department. This, at all events, is remarkably good in theory. Botany is taught by the lectures, demonstrations, and herborisations of a professor, and illustrated by an exemplification of 124 orders of the Jussieuean system in living plants. A considerable number of these plants are necessarily exotic, and kept under glass during winter; but, in May, before the demonstrations begin, they are brought out in the pots, and sunk in the earth in their proper places in the systematic arrangement, with their names and the names of the orders to which they belong placed beside them. The cultivation of vegetables, and all the different operations of agriculture and gardening, are taught by another professor, with assistants, and exemplified by different compartments in the garden. For instance, there is one compartment in which all the different operations on plants and on the soil are exemplified, from the different modes of preparing the soil for sowing or planting, through all the species and varieties of propagation, training, and pruning, even to hedge-growing and fence-making; another compartment contains all the plants of field culture; another all the medicinal plants; another all the principal timber trees; another, as far as practicable, all the fruit trees. Specimens of the different implements are kept in one building, and of the principal soils, manures, and composts in an appropriate enclosure; and so on. The essence of the lectures, accompanied by figures of such of the implements and operations as admit of representation by lines, will be found in *Thouin's Cours de Culture et de Naturalisation des Vegetaux*, by Oscar Leclerc, three vols. 8vo., with one quarto volume of plates; and a complete description of the garden is given in the well known work of Royer.—*Gard. (Eng.) Mag.*

TO DESTROY VERMIN ON PLANTS.

By a correspondent of the Gardeners' Magazine.

In all the recipes for destroying *Acari* which I have seen, sulphur is an ingredient; this, in its crude state, will not unite with the liquids used for that purpose, and therefore it can have little or no effect, except when applied as a wash on the heated flues of a house. In order to make it unite with soap suds, tobacco water, and other liquids usually made use of for destroying insects, it must be converted into a sulphuret, by boiling it with lime or an alkaline salt, as in the following mixture, which expeditiously and effectually destroys the red spider, by merely immersing the plant, or part infested, in the mixture:—Common soft soap half an ounce, sulphuret of lime* one ounce by measure (or two table spoonfuls,) soft water (hot) one ale quart. The soap and sulphuret to be first well mixed with an iron or wooden spoon, in the same manner as a mixture of egg and oil is made for a salad; the hot water is then to be added by degrees, stirring the mixture well with a painter's brush, as in making a lather, by which means a uniform fluid will be obtained, like whey, without any sediment, which may be used as soon as it is cool enough to bear the hand in it. This mixture will destroy every insect usually found in the greenhouse, by mere immersion, except the Coccus, or scaly insect, which adheres so closely to the stem, or under side of the leaf, that the mixture cannot reach its vulnerable parts; therefore, in this case, the mixture must be applied with a brush that will dislodge the insect. If the mixture be put into a wooden bowl, or any other shallow vessel, small plants in pots, and the leaves and branches of larger ones, and of fruit trees, may be easily immersed in it by pressing them down with the hand. The above mixture will not destroy the black Aphides of the cherry tree, nor the green Aphides of the plum tree, by immersing the leaves and branches in it; there being an oiliness on these insects which prevents its adhering to them. It will destroy them by applying it with a brush: but this is too tedious a process. It has been recommended, by writers on horticulture, to wash these and other fruit trees against walls, before the leaves and buds appear, with mixtures which cannot be safely applied after; for which purpose the above

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* The sulphuret of lime is easily made in the following manner:—Take of flour of sulphur one ounce; fresh lime, finely sifted, two ounces; soft water a quart, boil the mixture in an iron vessel about a quarter of an hour, frequently stirring it after it begins to boil; let it stand to settle, and pour off the clear liquor. If it is not used on the same day, it must be put into a bottle filled with it, and be well corked; for, if it be exposed to the air, it will soon attract oxygen, and will then curdle the soap, and smear the plants with a white substance, which is not easily washed off.

mixture, with the addition of spirits of turpentine, is likely to succeed as well as any other, or better: but I have not yet had an opportunity of giving it a trial. Half an ounce, by measure, of spirits of turpentine being first well mixed with the soap, and the sulphuret and water added as before; or the wash may be made stronger, by adding twice the quantity of each ingredient to the same quantity of water. For destroying slugs and worms there is no recipe so simple, attended with so little trouble, and, when properly applied, so effectual, as common lime-water. The plants on which the slugs are found must be watered with it twice at least, at an interval of three or four minutes. If you place three or four slugs on the ground, and pour lime-water on them from a watering pan, you will soon perceive them throwing off a kind of slough, and after that crawling away; but if you sprinkle them again with the lime-water, they will not be able to throw off another slough, and soon die after the second operation. When a person has therefore watered as many plants as takes up the time of three or four minutes, he must turn back to the place where he began, and water them again. Lime-water, for this purpose, may be easily made so as to be always ready. Into a trough, containing about fifty-five gallons of water, throw in two or three shovelfuls of lime, stir it up three or four times on that day, and the next day the liquor is clear and fit for use and will continue to answer the purpose for some time, without adding any fresh lime, by stirring it up again before it is used, and letting it settle. If the lime-water be of sufficient strength, it will destroy the large grey snail with twice watering, and all worms that are out of the ground at the time of watering, and it will not injure the most tender plant when used in a clear state.

THE CASTLE HOWARD OX.

From the British Farmers' Magazine.

This most wonderful specimen of the short-horned breed was lately exhibited in York, and excited the astonishment and admiration of crowds of persons who went to see it. Its color is white —stands about seventeen hands high—measures three feet four inches across the loins—and weighs upwards of 2[illegible] stone.

ON REAPING WHEAT BEFORE THE GRAIN IS HARD.

For the Farmers' Register.

There have been published at different times various and opposite facts and opinions with regard to the propriety of reaping wheat before the grain is hard. In the agricultural journals both of Europe and the United States, reaping green has been announced by different persons as an important discovery, and as if the practice was altogether new to the reporter and to his readers in general. To meet these statements, there have been others presented, of experiments conducted apparently with much care and accuracy, of the comparative value of grain reaped ripe and green, and the results of which showed a certain loss in the latter practice. Each of these various statements, so far as I know, stands alone, and is not compared, or considered in connexion with others which are apparently in contradiction. This deficiency it is my object to supply, in addition to offering the results of my own practice in this respect. The subject, in my opinion, presents one of those cases in which both sides of the question are true, though each may appear erroneous to those who will not compare the opposite views, and take into consideration all the circumstances which operate, or may be expected to operate, during the time of reaping. It may be true, (and I readily admit it as true,) that a head of wheat permitted to become perfectly mature on its stalk in fine weather, will furnish the greatest possible weight of grain, and of the best quality, to be derived from the particular growth of wheat: and that another taken off in a soft and green state, probably loses something, in quantity, or quality, or both, and cannot possibly gain in either of those respects. This is the amount of the results shown by the experiments referred to above, even if it is conceded, (though very doubtful,) that the manner of making such comparative experiments was perfectly correct. But though there may be no gain from reaping green in fine weather, and even some small loss of product, yet fine weather we almost never have through harvest—and it will be better to lose five per cent. by reaping green (admitting such a loss to be certain,) than to save it by maturing, and then to lose far more from bad weather occurring while the wheat is standing in the field. This, I think, is the proper view of the subject, and the proper mode of instituting a comparison of the products. If we could be sure of having dry weather, I entertain no doubt of the propriety and economy of not reaping until both grain and straw are ripe. But with the strong probability of more or less of rain—and the possibility of a long spell of it—I am as sure that a great saving will be found in reaping wheat as early as the state of the grain will permit. What that state is, has not been described very particularly, in any of the publications I have read; and it is not unlikely that the uncertainty on this head has caused some of the differences of opinion as to the propriety of the practice in general. I consider wheat fit for the scythe when the grain is in the *dough state*—no matter how soft, provided it is clear of milk, or when no fluid comes out separate from the dough, when the grain is mashed between the fingers. But no one square yard of wheat can be found, in which all the heads have reached this state at one time: and, therefore, when not more than one-tenth part of the grains contain milk, I think it safe to begin to reap. There will be some loss in the quantity of all the milky grains, (though no injury to the quality of the sample in general,) but less than would be usually found by waiting long enough for every grain to be free of milk. If the Mountain Purple Straw is the kind made (which has generally formed the greater part or the whole of my crop) it may be easily known by the purple tinge on the stalk, when the grain has reached the dough state.

As I place the advantage of reaping green on the greater certainty of avoiding the effects of bad weather, it may be inferred that the experience of several years would be required to make a correct decision. I began this practice in 1821, and have never since failed to begin harvest as soon as enough wheat was fully in the dough

state, except in those years, when the pressure of other farm business made it necessary to let the wheat wait some days longer. If, therefore, this opinion is held by me improperly, it is not for want of experience, but for want of judgment.

The universal practice in my neighborhood before 1821, was to wait for the grain to be hard; and if there was any doubt of the straw being perfectly sapless and dry, the wheat was left on the ground, without binding, for one or two days, to be dry enough to stack. My green reaping, when first commenced, was fully nine days earlier than was usual—and it was pronounced then that I was destroying my crop, by reaping it so green. My practice is still condemned by many, who, however, have gradually and perhaps unconsciously, advanced the commencements of their harvests, until they are not more than two or three days behind mine.

The first year of my early reaping was most fortunately chosen. After weather generally fine until the latter part of June, there began the longest spell of rainy weather that I ever knew at that time of the year. The rain fell more or less for seven days in succession, without enough sunshine (if any) during the time to dry the wheat at any one time. I did not keep a farm journal that year, as was my general practice, but noted these circumstances before the next harvest, while they were fresh in my memory. I did not there state, and do not remember, the date of the beginning of my reaping in 1821; but the whole was finished, and the last reaped was shocked, just before the long spell of rain began. It had rained gently one day only during my harvest; and a piece of thin wheat, of about 25 acres, had been cut down on that day, and still remained open on the ground. So much of this had sprouted before the rains ceased, and so much on the tops of the shocks throughout the crop, that I estimated my loss at one-tenth of the whole. But that loss was small indeed compared to that of my neighbors, and of lower Virginia generally. Some had not begun to reap—but few had been as many as three days in harvest, when the spell of rain commenced—and scarcely any wheat had been put up in shocks, or secured otherwise. The wheat left standing was so bent down, as not to be tolerably saved, besides being greatly damaged in quality; and what was on the ground was mostly sprouted. My notes state as the supposed estimate of general loss through our part of the country, from one-half to two-thirds of the crop. Some good managers, and many bad ones, did not make as much wheat as they had sowed, and that of such bad quality, as to be unfit to sow again. Indeed the destruction of wheat was so general, and so little was left good enough for seed, that it caused many who were before hesitating about such a change of crops on light soils, to abandon wheat entirely, and take cotton instead, as their principal crop for market.

The saving made that year by early reaping was enough to pay for all the loss to be incurred by that plan in twenty years: and though such a spell of weather may not occur in a long life, there is scarcely any year in which more or less is not lost by rain compelling wheat to stand (or to lie,) too long in the field. When rain stops the reaping of green wheat for three or four days, the farmer is left just where he would have been without the rain, if he had waited to reap ripe. But to him whose wheat was dead ripe, having his reaping suspended for a few days is a most serious damage. Even if no grain is actually sprouted, every wetting and drying after it is ripe, is injurious to its quality. Besides this, no field can be reaped as easily, and as effectually, after as before rain. Heavy wheat is lodged, and sometimes lost completely: and the stalks on the lightest and poorest land bend in curves, and in every direction, so as to render it impossible to be saved well when reaped.

Now to consider the objections to reaping green. I have admitted that there must be a loss, from shrinking, in every grain having any of the milk remaining, and a general loss on the whole crop, on the supposition that a proportion will be in the milky state. But, (though it would be difficult to test it by fair experiment,) I do not believe that any thing is lost in either the weight or bulk of grain cut in the dough state. There is loss of labor however, (that is, if the weather continues dry,) and there is risk of loss, from putting the sheaves into shocks or stacks before their being perfectly cured. Green wheat may be made up into small sheaves, (the band being a single length of the straw,) as fast as it is cut down: but the straw will shrink so much on drying, that the bands will be apt to become loose, and many of the sheaves to fall to pieces. If the binders are kept half a day behind the reapers, that objection will be obviated: but others will be presented in the loss of labor when the reapers and binders are thus separated, and the exposure of a greater quantity of wheat, after its being reaped, to rain. But it should also be considered, that green wheat is less hurt when caught by rain, than the perfectly ripe would be.

If the wheat is sheaved when too green to put into shocks, it should be put up in "stooks" of about six sheaves each, by setting the stubble ends of the sheaves far enough apart to give sufficient base, and letting the heads of all the sheaves lean together so as to form a point. These stooks are easily made, will throw off a light rain, and will dry as they stand, if made wet by heavy rain. I have had such stooks to be wet and dry repeatedly before the wheat could be put into shocks—without any more injury than would have been sustained if the wheat had been standing. But this was of the purple straw kind. Before I knew the difference, I permitted some white wheat to go through the same treatment, and found much of it sprouted by rain in the stooks.

As to the quality of the grain, for making flour, I believe it is generally conceded that the wheat reaped green is best.

What is the extent of the gradual advancement of the usual time of reaping, I cannot state, though aided by written memoranda of my own farm business for most of the years of the last twenty. Many of those who have never noted such things, are not aware that they now venture to reap in a state of greenness which they would have thought very hazardous formerly. I remember well that fifteen years ago, our festival of the 4th of July always came in harvest, and that no one finished reaping before that time, unless he had sowed early wheat, and had a very small crop. In 1819, I began to reap on June 23d, (golden chaff wheat,) and the entry on the journal of that day states that the grain was

not quite hard. I suppose that time to have been as early as any one would have ventured then. The following are all the dates of the commencement of my harvests, which were recorded before my change of practice, and for some years afterwards.

1818—June 25th.
1819— " 23rd.
1822— " 8th.
1823— " 13th.
1824— " 11th.
1825— " 10th.
1826— " 12th.—and might have been begun 5 days sooner, if the state of other crops had permitted.
1827— " 16th.—the ripening stated to have been made unusually late, by the depredations of Hessian Fly, added to a cold season.
1828— " 12th.
1829— " 19th.—the beginning having been delayed two or three days by the pressure of other work.

The purple straw, and golden chaff wheats, were the kinds sowed.

There is so much difference in these dates, added to my recollection of our late harvests in general, formerly, that I am somewhat tempted to think that there has been an increase of average temperature, as well as of change of practice in reaping. But if that was the case, so important a fact could not have escaped the notice of the many curious and particular observers of the changes of temperature, as indicated by the thermometer.

E. R.

REMARKABLE HABITS OF THE AMERICAN LOCUST.

There is no longer any doubt that these singular insects are to make their usual periodical appearance the present season. They are already easily to be found, at the depth of six or seven inches, in gardens, and especially in orchards, under old trees. By skimming off the surface of the earth, thousands of holes are perceptible, where they have been penetrating to the surface, in order we presume, that their way may not be obstructed on their day of general resurrection. An old gentleman of this place, informs us that his father kept particular note of their appearance in four instances, and that he himself has followed it up, and preserved observations, also, in four instances—and that they have uniformly appeared every seventeen years; but what is singularly striking, that in all these eight instances, they were found to have a general resurrection day, which has regularly occurred on the 25th May. He further says, that two or three days previously, a few make their appearance, as a reconnoitering party; but on the 25th, the whole country is deluged with one interminable swarm.—*Germantown Tel.*

[If it is indeed true that there is so much regularity in the continuance of the dormant state of these insects, the time of their coming forth is not the same in different places. It was in 1829 that they appeared in prodigious numbers in this county, (Prince George,) where they had not been observed before within the recollection of any person whose opinions we heard expressed. They were in much the greatest numbers in woodland where the soil was stiff and close: and in all such places, every tree was supplied with locusts in such numbers, that a traveller for miles together could perceive no cessation, or change in the loud but monotonous chorus kept up by their voices. These insects caused no injury. They were not much more than half as large as the common green and black locusts, (or *dry flies*, as vulgarly called,) which, in small numbers, appear here every summer. The color of the former was touched with a pale dingy red, instead of the green which the common locust has. The name applied to both these insects is doubtless incorrect, as both differ widely from the great plague of the earth in other regions, of which we are so fortunate as to know nothing in this country, except by report.

There is too much of the marvellous in the regularly returning visits of our locusts for the statement to be altogether credited, though it has been stated in several publications besides that quoted above. But at any rate, there must be enough in the habits of these insects, that is both true and strange, to excite curiosity, and invite attempts at investigation.]

HARDENING OF IRON.

From the Southern Planter.

Dr. Bartlett—It may be considered presumption in me to attempt to give directions to a blacksmith how to temper a tool when he has made it. If I cannot *teach* a blacksmith I can *tell* a farmer how to avoid imposition.—I have noticed for several years that ploughs made and tempered by some smiths would last twice as long as the same kind made by others—this is owing to the manner of tempering.— In tempering a plough, all that is necessary is to give it a thorough heating and cool it quick. In order to cool quick, it is necessary to have plenty of water, and that of a good quality.—To undertake to cool a plough that weighs 8 or 10 pounds in two or three gallons of water, is absurd; more especially if that water has been heated a great many times.

WM. H. RAIFORD.

Henry co. May 5th, 1834.

BUTTER MAKING IN CHILE.

From Waldie's *Journal of Belles Letters.*

In Chile, butter is packed in sheep skins, with the wool side out, and would be very good, in spite of appearances, were it not so much salted. The operation of churning is performed by a donque [an ass;] the cream is put into large gourds, or dry skins, placed on his back, and then the animal is kept trotting round the yard till the butter is made. In this art they seem not to have advanced a single step since its discovery; for we are told that a countryman somewhere lost a large jug of cream, by carrying it for some distance on a hard-trotting horse, which accident led to the important invention of churns and butter. A friend told me, that he had presented, some years ago, a Yankee churn to a family residing near the capital, and taught them to use it. So long as it was a novelty they were pleased, but at the end of a few weeks decided the donque made butter just as well, and consequently threw it aside!

HORSE-TEAMS—FEEDING EXPENSES—LABOR.

Extracts from the Farmers' Series of the Library of Useful Knowledge.

Animal labor is an object of the deepest importance, both to the public and to those individuals who employ it: to the former, inasmuch as the amount of food thus consumed is so much abstracted from the general means of subsistence; and to the latter, as the value of its employment consists in the proportion of its cost to its power. It is, therefore, in every point of view, desirable to economize it, so far as may be consistent with its efficient use, both through the saving of the labor and the feeding of the cattle by which it is performed; but to these considerations must be added a due regard both to the effectual performance of the work, and to the sufficient support of the animal. Less has been done for the farmer than for the manufacturer, in the improvement of machinery, and unless the power of the steam-engine should at some future period be applied to the plough, he must still be dependent for the production of his crops upon the labor of cattle, which absorbs so large a portion of his profits, that he cannot be too careful of this branch of his expenditure. In this, however, as in the regulation of manual labor, true economy lies more in duly apportioning the strength of the teams to the work to be performed, than in any mere saving of expense; and there is no part of a farmer's business that demands a sounder exercise of judgment than the selection and mangement of his working stock.

It is usually considered that one team, if well kept, is sufficient for the cultivation of from 40 to 50 acres of heavy land, and from 50 to 60 acres of lighter soil, under common rotations; but the strength of that team depends so much upon the breed and condition of the animals, as well as upon soil and culture, that this is subject to much variation. Some tenacious clays cannot be worked with less than four strong horses, or even more, on breaking them up; while a free loam may generally be managed with a pair and whip-reins; and a course of constant tillage necessarily requires a greater number of ploughs than when a large portion of the land is allowed to rest for some years under grass.* Teams should never be below the work to be executed: every such apparent saving will turn out a real loss to those who attempt it, and even a supernumerary horse, for cases of emergency, will seldom be found bad economy. The great point is neither to be above nor below the mark: no example need be adduced to show, that if too little power be employed, the work must be imperfectly done; and that if too much, a portion of it must be thrown away; nor, although working-cattle should not be pampered, is it necessary to prove the truth of the old saying, 'if they won't pay for feeding, they won't pay for starving.'

*In the report of the Morvich and Culmaily farms *(Farmer's Series, No. 18,)* consisting of 650 acres of arable land, it is stated that the whole work is performed by seven pairs of horses, including one pair of mares in foal, and one pair of young horses, thrown off to grass during summer: but the rotation on the greater part is,—1st turnips; 2d barley; 3d, 4th, and 5th, grass; and 6th, oats: on the remainder, 1st rape and naked fallow; 2d wheat; 3d and 4th, grass; and 5th, oats; or nearly one-half in grass.

Regarding Horse Teams.

It is a just observation, 'that one can hardly be at a loss to determine the character of a farmer from the condition of his horses*.' Very fine, high-fed cattle, exhibiting the appearance of being prepared for sale, rather suggests the idea of idleness than of labor; but, on the other hand, lean, spiritless creatures, worn out by toil and hunger, are the certain indications of a bad farmer; of one not thriving and who does not deserve to thrive. The man who employs bad instruments cannot have his work well done, and one important and previous step towards good farming, is to keep the laboring stock in good condition. Horses regularly fed, and regularly wrought, will perform a great deal of work without falling off either in strength or appearance: it is, therefore, of great importance to distribute the labor as equally as possible through the various seasons of the year: and to take care that if, as must sometimes be the case, an extraordinary exertion is to be made, they are in the proper order to make it. When once allowed to fall off, it requires much more to restore them, than might have kept them in a good state.

The *feeding of farm horses* forms so material a part of the charges on agriculture, that the manner in which they can be cheapest maintained is a matter deserving the most serious attention. It is an established principle, that animal power can only be exerted in proportion to the quality, as well as the quantity, of the food with which it is sustained. In conformity with that rule, hay and oats, or beans, given in their natural state, were long considered as the only horse provender possessed of the requisite degree of nutriment, and in consequence of its cost, penurious farmers stinted their horses, or those of an opposite disposition, who 'indulge in the pride of teams,' were put to very great expense. Experience, however, has proved that substitutes may be used to a very considerable extent, without injury to the animal itself, or diminution of its strength; and that different modes of preparing its ordinary food may be adopted with advantage.

The vegetables most commonly resorted to as *substitutes for corn and hay*, are potatoes, turnips, carrots, parsnips, and mangel-wurzel, with straw, and the haulm of beans and peas. Among these the potato ranks foremost, both in quality and in being more commonly cultivated than either parsnips or carrots; but it is attended with the inconvenience of requiring to be boiled, or steamed, as its juice has been found prejudicial, and in some cases even fatal, to horses, when given raw, and both it and the yam, which has lately been much employed for the same purpose, are apt to ferment in the stomach, and occasion dangerous colic, when used in a crude state. Of turnips, the Swedish is the only one that can be recommended to be given alone, though the common kinds may be advantageously mixed with potatoes; but, when given in that manner, they should be boiled separately, in order to preserve their juice, which if not given to the horses, will be found serviceable for store cattle and pigs. Carrots are much relished by all cattle, and when combined with dry food, have a most perceptible effect upon the horse's coat, soon imparting to it that glossy appearance which is one of the best tests of condition, and

*E. Lothian Survey, p. 197.

consequently of health: they are also thought to improve the wind. Parsnips are still more nourishing, horses eat them greedily, but they soon clog the appetite; and, in the island of Jersey, where the root is used extensively for other purposes, it is never given to them, for it is alleged that, when kept on that food, their eyes are apt to suffer injury.* Mangel-wurzel, though inferior to these, is preferable to any turnips, except Swedes.† All these roots, except potatoes, and turnips when used along with them or other substances, as a mash, are generally given raw, and care should be taken, in slicing them, to cut the pieces sufficiently small to prevent them from sticking in the throat if swallowed whole; an accident from which serious consequences have ensued.

In most instances only one half of the usual allowance of corn has been given to horses thus fed, and they have notwithstanding gone through their customary labor with as much apparent ease, and have been maintained in as good condition as when kept in the ordinary way. In some cases, all the corn, and in others, all the hay, also, has been withheld, and numberless accounts have been published to prove that the work has still been equally well done. Some of these are subjoined, in order that every one may judge for himself of the degree of attention to which they are entitled. It must, however, be remarked, that although farm-horses may be kept in very fair condition, and their common field-labor may be performed, at some seasons, without corn, yet that hard work cannot be supported without high feeding, of which sound hay and oats, and old beans or peas must ever form the chief part; though, even then, a portion of roots will be found serviceable in keeping the bowels open and the body in a healthy state. The following are a few of the statements most to be relied on.

In the details of management on separate farms, already published in the 'Farmers' Series,' we find that, in one instance, horses, constantly worked throughout the winter, as long as there is daylight, are maintained in good condition upon about a peck of oats, given in three feeds, chiefly of light corn, the last of which is made into a mash with yellow turnips, bran, and chaff, steamed or boiled together on the previous day: turnips are also given raw, and the only rack-meat appears to be oat-straw.‡ In another, only one feed of oats is given, together with hay and bean-haulm, and Swedes, both raw and steamed; and it seems that some farmers substitute Swedish and yellow turnips wholly for corn, yet their cattle are said to be fresh and in good working order: but it is admitted in both these instances, that when there is much carting, oats are allowed according to the work, and the quantity is increased in the spring.§

The late Mr. Curwen, who tried more experiments than most men in the feeding of cattle, kept nearly a hundred of his colliery and farm-horses during the winter upon equal quantities of *cut straw and potatoes*, steamed together, in lieu of hay; and found that some which were worked in the same manner, but fed with hay instead of potatoes, were not in equal condition with the others.* His mode of feeding, as detailed by the Carron company, who have adopted his plan, is thus:—'They have three tubs steaming at a time: two of potatoes, and one of chopped straw, chaff, or dusting-seeds; they empty one tub of potatoes into a large mash-tub, by way of bottom layer; then the tub of chopped straw, and last, the remaining tub of potatoes: the whole is wrought up and mixed with a large wooden pestle; and to this they add a small quantity of salt. A bucket is brought for each horse with his feed of corn (bruised oats) in the bottom, and his proportion of the mash is filled in above; when it is emptied into the manger, the corn is of course uppermost, and the horse feeder puts his hand through to mix it.'† They feed warm. The quantity of food, and calculation of expense, are as follows:—

Farm Horses.

	s.	d.
1½ stone of potatoes, at 3*d.* -	0	4½
7lbs. of cut straw 1*d.* and cutting 1*d.* - -	0	2
Steaming - - - -	0	0½
7lbs. long straw - - - -	0	1
8lbs. of oats - - - -	0	8
	1	4

Colliery Horses.

	s.	d.
8lbs. of hay and 8lbs. of straw cut together	0	5½
Cutting - - - -	0	1
7lbs. of steamed potatoes - -	0	1½
6lbs. of carrots - - -	0	2½
12lbs. of oats - - - -	1	0
per horse, per day,	1	10½

The potatoes are estimated at 50*s.* per ton, inclusive of the expense of steaming; oats at an average of about 3*s.* 4*d.* per bushel; hay at 2*l.* 12*s.* 6*d.*, and straw at 15*s.* 6*d.* per load, exclusive of the cost of cutting.

After several years experience of the comparative merits of steamed potatoes and straw, or hay, Mr. Curwen gave a decided preference to the former, both as regards the saving of expense, its effects upon the health of the animal, and its power of upholding their condition; but notwithstanding the apparent candor of his testimony, and its being corroborated by many similar statements,‡ it is well known that, when much exertion is required, both hay and corn become necessary.

*Quayle's Survey of the Island on the Coast of Normandy, p. 103.

†Statements of the proportionate value of these and other articles of cattle food, will be found under their respective heads in future chapters.

‡ No. 18, p. 70. § Ibid, p. 97. See also No. 12, p. 43.

N. B. One peck and a half of oats make four Scotch *lippies*, or feeds, as alluded to in these accounts; or one-half more than the quantity usually considered as a feed in England.

* Hints on the Economy of Feeding Stock, &c. &c. by J. C. Curwen, Esq. M. P.

† Communications to the Board of Agriculture, vol. v. No. 10, p. 210.

‡ See the Farmers' Magazine, vol. xi. p. 334, and xiv. p. 229; and the Survey of Dumfriesshire, chap. xiv. p. 376. The latter account states the quantity given to be 42 lbs. of potatoes and about 10lbs. of straw, without any oats, *except when the horses are employed, on the road.*

In Essex, we have the authority of Messrs. Vancouver and Arthur Young, who separately surveyed the county, that working horses have been kept through the winter entirely on *steamed potatoes*, to every 300lbs. of which there was added half a pint of salt, and occasionally a small portion of surphur; and that, 'fed in this manner, they performed with the greatest ease *all the common labor of the farm*, without either hay or oats.'* The difference of the expense of a team of five, during half a year—calculating the potatoes as worth 40*s.* per ton, and hay and oats respectively at £3. the load, and 24*s.* per quarter, which nearly accords with the estimate of consumption in the survey, would stand thus:—

Potatoes.

	£.	s.	d.
5 Horses 182 days, at 50 lbs. each, 45,000 lbs. † or 18 tons, at 40*s.*	36	0	0
Washing and steaming at 2*d.* per 100lbs.	3	15	0
3 Bushels of salt at 2*s.* - -	0	6	0
Sulphur - - - - -	0	2	6
	40	4	4(*a*)

Hay and Oats.

	£.	s.	d.
5 Horses 182 days, at 24 lbs. each, hay, 21,840 lbs. or 10 5-6 loads at £3	32	10	0
Ditto 26 weeks, at 2 bushels each, oats 32½ quarters at 24*s.*	39	0	0
	£71	10	0
	40	4	4
Balance in favor of potatoes,	31	5	8

The cost would thus be a fraction more than 10½*d* per day, and the saving about six guineas for each horse in the winter half year, if they could be kept in that manner so long; but this mode of feeding cannot be commenced before November, nor continued after February, for, notwithstanding the assertion of the reporters, as well as of many other persons of veracity respecting the 'common labor of a farm,' during the depth of winter, it cannot be continued during the spring, upon land that is properly cultivated, without either an unusual number of horses, or an allowance of corn.‡ Upon this statement, it is also to be observed, that supposing the oats to weigh 35 lbs. per bushel, the daily allowance would then be 34 lbs. of hard meat, or 1*s.* 7*d.* per day, which is the highest estimate that can be admitted for a common-sized cart-horse, and would assuredly support him in better condition than any quantity of potatoes that he could consume. Were the allowances of corn and hay reduced in a fair proportion to the working value of the food, the cost would, therefore, be more equalized; but although experience may not justify the sanguine expectations of the advocates of leguminous plants, as horse-meat, to the full extent of their calculations, there can yet be no doubt that on light soils, and in situations which do not afford a market for field roots, they may be advantageously substituted for hay, and when the work is not severe, even for a considerable portion of corn.

Regarding *carrots*, we have also the evidence in their favor of Mr. Curwen, who substituted them for a portion of the usual allowance of corn, and has adduced a certificate from his groom and farrier, that "when from 8 lbs. to 12 lbs of oats are allowed to a work-horse per day, according to its employment, 4 lbs. may be deducted for 5 lbs. of carrots, and the spirit, condition, and ability of the horse to perform his work improved by the same:"* but the saving this effected amounted only to a shilling in the week. Other accounts state a bushel of carrots to be given daily instead of oats; and an Essex sportsman is mentioned, whose horses, thus fed, without any corn, follow a pack of harriers twice a week.†

In the Sandlings of Suffolk, horses are chiefly fed on carrots, with sometimes hay, and sometimes corn, and sometimes with only straw; viz:—

6 horses, 2 loads of 40 bushels per week, no corn, and a little hay.

Do. 1 load, with corn in the spring-time, and little hay.

Do. 72 bushels per week; no oats, and half the usual allowance of hay.

The horses are said to be in superior condition than when fed on oats; but this probably arises from their being allowed as much as they will eat, while oats are allowanced.‡ In Surrey, also, where carrots are extensively cultivated, a team of four good horses gets about 60 bushels per week until Christmas, with plenty of sweet chaff, or clover hay, but no corn; and after that 40 bushels are given, with 2 bushels of oats, and a sufficiency of chaff.‖

Common turnips scarcely merit notice as horse-food; but *Swedes* have been given in various instances, besides those already particularized, with evident advantage, both sliced in their raw state, and steamed; and as they are both more commonly cultivated and less expensive than most other roots, they are deserving of the superior attention of economists.

Steam.

The chief value of boiling, or *steaming the food of animals*, seems to consist in rendering it more easy of digestion, and thus, perhaps enabling them to retain a greater portion of its nutriment than

* Young's Survey of Essex, vol. 1, p. 398.

† The cwt. of potatoes is usually calculated to weigh 126 lbs. Then 126 by 20=2520 by 18=45360. V. Thaer calculates 1 cwt. of hay as equivalent to 3 bushels of potatoes: both, however, necessarily vary much in quality.

‡ A correspondent in the Farmers' Magazine, vol. ii. p. 217, recommends a mixture of 4 lbs. of boiled potatoes and 4 lbs. of bran, at each feed: adding, from six years' experience, that this method 'saved much corn, and gave his horses a very fine skin.' Were 2 lbs. of ground oil-cake substituted for the bran, it would form a far heartier feed, without much difference of cost.

(*a*) The error in this calculation is in the original. [*Ed. Farm. Reg.*]

* Hints on the Economy of Feeding Stock, &c., p. 207.

† Berkshire Report, p. 228. Essex do., vol. ii., p. 5. In the communications to the Board of Agriculture, there is also an instance of farm-horses fully worked and fed entirely on carrots, instead of hay; but they get 70 lbs. each, sliced, along with chaff.—Vol. vii., art. ii., part 1.

‡ Suffolk Report, chap vii., p. 125—140.

‖ Malcolm's Modern Husbandry of Surrey, Kent, and Sussex, p. 482.

when it is used in a crude state. For old horses especially, whose teeth being worn are incapable of effectually grinding the corn which their work may render necessary to their support, and whose powers of digestion are weakened by age, this is an incalculable advantage. Being softer than dry food, it is besides more readily consumed, and consequently allows more time for lying down and taking rest, a difference of more importance in its favor than may be generally imagined, for a horse takes from three to four hours to masticate a stone [14 lbs.] of hay, but a mash of potatoes of double that weight may be eaten in forty minutes. But for young and working cattle, in the full enjoyment of their health and strength, it may admit of doubt whether the constant use of such soft food may not weaken the powers of digestion, and relax the tone of their muscular fibre; for it has been found, from very careful trials, that, when only a small quantity of roots is given, the health and condition of the animals are improved by giving them in a raw state, as, in that form, they have a kindly effect upon the bowels; and, besides promoting the digestion of grain and straw, which they do in a remarkable manner, they impart to the animal an additional degree of life and spirit. In cases, however, where they have formed the chief article of food, boiling or steaming has been found to possess a more fattening quality, for it has the effect of depriving vegetables of a part of their watery juices, leaving only the farinaceous and other solid portions: thus potatoes lose about an eighth of their weight by the evaporation of water, when they are steamed, and about one-sixth of kiln-dried or baked, in which state they are, from the chemical change which they have undergone, more nutritious than when raw. There is, however, very essential difference in the quantity of nutritive matter obtained from various qualities of the potato; for although when dried, the fibrous, or solid matter may be of equal weight, yet it has been shown by various experiments that the product of starch, which constitutes the most nutritious portion of their substance, varies from one-fifth to one-seventh of their product.*

The superiority of the method of fattening cattle with food thus prepared has been proved by many experiments; and it is even said, that some post-masters on the Western road having, in pursuance of a suggestion of the Bath Agricultural Society, boiled the oats for their horses, and given them the water to drink, have ascertained that a bushel given in that manner will maintain a horse in better condition than two in the common way.† So broad an assertion may well be received with hesitation: yet the experiment is worth a trial; and if used with caution, and mixed with a certain quantity of dry food, there can be little doubt that steaming a portion of horse provender, whether mixed with roots or not, will be found an economical plan. Mr. Curwen recommends it to be given warm; and no one at all acquainted with stable management can be ignorant of the comfort of a warm mash to a horse after extraordinary fatigue; it also improves the appearance of the coat, and the seeming condition; but it is not natural to the animal; and notwithstanding the experience of Mr. Curwen, it may yet be doubted whether, as a constant practice, it would not be too relaxing. At the utmost, the mere chill should be taken off.

The objections usually urged against steaming are, the expense, the trouble, and the difficulty of preparing the feeds for several teams. But an ordinary *steam apparatus* may be put up for a mere trifle, and food enough for a dozen or twenty horses be got ready, with little difficulty, in a short space of time, and with a very moderate quantity of fuel. When the cattle are not sufficiently numerous to justify the erection of a steaming-shed, the copper commonly placed in the corner of every wash-house may be replaced by an iron boiler, and used for this purpose.

Fodder.

Notwithstanding the numberless experiments which have been lately made on almost every kind of cattle food, and the extensive use of *straw as fodder*, it is remarkable, that no accurate account has yet been published of the relative properties of the different species. Those writers who have treated the subject the most scientifically yet vary in their estimation of its qualities,* and these are subject to many gradations, according to the soil and season, as well as to the nature of the grain by which it is produced. It is thought that, when grown on gravelly or rich clay soils, it is more valuable as fodder, than when it is reared on black deep loam or cold moorish land; and it is now generally admitted that it possesses more succulence when the corn is rather green than when it is in a riper state. It is supposed by many that the straw of wheat is the most nutritive; it certainly makes the strongest manure, and is thought to be the best for either steaming or cutting into chaff. Although that of oats is usually preferred, as more soft and more palatable to cattle, that of barley is so poor and brittle, that it is only employed as litter; it is extremely difficult to save it in any tolerable degree of order; and, though it has been said to possess more nutriment than that of wheat, yet, when the crop is fully ripe, the ears break off in handling, which has been contended as sufficient proof that it contains but very little sap.† Rye-straw is so scarce in all except the northern counties and some parts of Wales, and is in such demand for thatching, brickmaking, &c., that it is but seldom applied to other uses.

When not allowed to be carried off the premises, the chief value of white straw, for farm purposes, lies in its conversion into manure—for although it may carry store-cattle through the winter, it will neither fatten them nor enable any animal to work—and its intrinsic worth, for the uses of litter and of occasional feeding, has been estimated by experienced farmers as high as 30*s*. the ton;‡ but that calculation was made at a time when all farm produce, and consequently manure, was higher than at present, and it may now be reduced to 20*s*. Weight for weight, there is a material difference between that and the common price of hay; but as the same quantity cannot be substituted for hay, either its own proportionate increase of quantity, or the value of any other

* Sir Humphry Davy's Agricultural Chemistry, p. 128.

† Mechanic's Magazine, October, 1831.

* Professor Von Thaer, Principes Raisonnes d'Agriculture. Annales de l'Agriculture Francaises.

† Scottish Husbandry, pp. 378—386.

‡ Sir John Sinclair: Scottish Husbandry, 2d Ed., p. 880. Brown, of Markle, Treatise on Rural Affairs, vol. i. chap. v.

food given to make up the deficiency, must be added in order to ascertain the saving: thus, supposing 24 lbs. of hay, at 3*l.* per load, to be the daily allowance of a horse, and this to be replaced by 24 lbs. of straw, and 28 lbs. of Swedish turnips, the latter valued at 6*s.* 8*d.* per ton, or 4*d.* per cwt.,* the difference excluding fractions would be

		d.	
24 lbs. of hay, or 8½*d.*	24lbs. of straw	2½	or 9*s.* 4*d.* to 10*s.*6*d.* per week on a team of four.
	28 " turnips	1	
	drawing and slicing	½	
	(if steamed)	½	
	Saving per horse per day	4	
		8½	

Whenever straw is used, weight for weight, instead of hay, their relative value, *per load*, may be estimated according to the following scale:—

	lbs.		
Hay 36 Trusses, 56 lbs. each †	= 2016	hay at 45*s.* =	straw at 28*s.*6*d.*
Straw do. 36 lbs. do.	= 1296	" 60*s.* =	" 38*s.*
		" 72*s.* =	" 45*s.*7*d.*
		" 84*s.* =	" 53*s.*2*d.*

From which calculation it results that, even when the sale of straw is permitted, it may be economically substituted for hay, during the winter months; for the customary market load of wheat-straw seldom fetches more, even in great city markets, than 36*s.*, which, deducting the expenses of binding and carriage, will not, in most places, leave so much as the above sum net. ‡

The *haulm of beans and peas*, but especially the latter, when well harvested, forms a very hearty species of fodder. The stalk of the beans, indeed, is tough and somewhat woody, and is therefore commonly thrown out as farm-yard litter; but the coving chaff is very good manger-meat, and even the stalk, if bruised and cut and then steamed, would be found useful in a farm-stable.

Pea-haulm is very generally employed as rack-meat, for which purpose it is well adapted, being succulent and nutritious, and nearly as much relished by cattle as hay, and although it may not go quite so far, there is yet a great saving in its use. But both these, and all other kinds of straw and haulm, should be given as fresh as possible from the flail, for they grow brittle, and lose a portion of whatever sap they possess by exposure to the air: if long kept, they grow musty, and in that state neither are wholesome nor will be eaten by horses. Pea-haulm should be given cautiously, as it is flatulent and apt to occasion colic: it is also said to be productive of bots; but that, if true, is not so peculiar a property as to prevent its use.

* The value of the turnips is calculated on the supposition that the acre produces 15 tons *of roots*, exclusive of tops and tails, worth 5*l.* per acre on the ground. The quantity is too high for some soils, and some modes of cultivation, especially in the southern counties of England; in others, it is too low, but, as an average, it comes near the truth, and each farmer may make his own calculation according to the produce of his land.

† N. B.—The market weight of the truss of *new hay*, is 60 lbs., until the 4th of September.

‡ Mr. Middleton calculates the expense of binding and marketing straw, within eight to ten miles of London, at 15*s.* 6*d.* per load; viz. binding 1*s.*, two horses, cart, and driver 11*s.* 6*d.*, toll-gates 1*s.*, beer, market, and salesman's charges 2*s.*, which, allowing 5*s.* 6*d.* for back carriage of dung, would reduce the net price to 26*s.* per load—*Survey of Middlesex*, 2d edit. sec. iv. p. 222.

The *straw of canary-seed* is also an excellent fodder; but the cultivation of the grain is too limited to render it an object of general notice.

Proportion of Dry Food.

The most nourishing food given to horses consists of corn; and *oats* are commonly considered as the best adapted to their constitution; but when any other species of grain is furnished in like proportion of weight, the nicest observers have not been able to discover any apparent difference in its qualities, provided it be mixed with a proportionate quantity of straw, chopped fine, or of bran, to supply the place of the husk of the oats, without which other corn should not be given. Horses when not pressed by hunger, often try to separate this chaff, or bran, from the grain, and it is therefore customary to sprinkle it with water; but in that case the greatest care should be taken to thoroughly cleanse the manger, for nothing is more noxious to horses than food thus wetted and allowed to become stale. Grain of every description ought to be free from the natural fermentation which it undergoes if not in a perfectly dry state. Oats harvested in a wet season have been known to occasion epidemical disorders among cattle, and farmers frequently do serious injuries to their horses by supplying them with it soon after it has been reaped. Corn that has sprouted is not unwholesome, provided it has not imbibed a bad smell from having been heated; and malt, or barley which has been only slightly steeped for two or three days, though without being dry-malted, is considered particularly nutritive. It is thought, indeed, that the completion of the process adds much to its invigorating properties, and it is often used in that shape on the continent, though not in a larger proportion than one-third of other grain; * but, even if it has that effect, the duty on malt prevents its consumption by cattle in this country, and it cannot even be purposely wetted without incurring the suspicion of the excise. Many horses, also, which eat voraciously, are in the habit of bolting their food without chewing it; in which case their oats should never be given without being either mixed with chaff, or else bruised by cylinders, such as are used in bruising or grinding malt.

Beans, and latterly *peas*, are also largely given to farm-horses, without any prejudicial effect; and, if care be taken not to supply them in summer, at which season they are found to be too heating, no bad effect will be found to arise from their use: but, as they contain an unusual proportion of sap, they should be at least twelve months old: if they shrink in quantity, it will be made up in quality.

When horses are fed on *hay*, it is a matter of dispute whether the light and apparently arid grass of uplands, or that of more fertile natural meadow ground, or the rich produce of the artificial grasses, is to be preferred. This must however depend on the quantity of corn with which they are supplied. When that is abundantly furnished, there can be no doubt that the former will be found better for their general health, and especially for their wind; but as farm-horses are generally limited in their consumption of grain, and the slowness of their movement renders the clearness of their wind a

* Von Thaer, Principes Raisonnes d'Agriculture, vol. iv. p. 695.

matter of comparatively little moment, the other kinds will be found the most substantial, and consequently the best adapted to support their strength.

There can be no doubt that the feeding of horses upon hay, in whatever quantity it may be supplied, can never be entirely substituted with equal effect for corn; but opinions are also divided respecting the proportion in which it may be furnished, both with regard to health and economy. On this, however, no general rule can be laid down, for it must not only depend upon the animal's constitution, but also on the work which he has to support. It has, however, been calculated, by a foreign writer of great experience,* that ordinarily 8 lbs. of meadow-hay are equal in nourishment to 3 lbs. of oats: 7 lbs., however, of sainfoin, tares, clover, or other succulent hay, are supposed equal to the same quantity, though sainfoin is perhaps entitled to the preference; but 9 lbs. are thought to be required from hay made of poor pasture. The longer too, within a certain time, that hay is allowed to stand in the stack, the better it is, and perhaps that which is a year old is the most wholesome for horses: the second growth is not equally nourishing. It should also be got into the stack as soon as properly dried, in order to preserve the freshness of its scent, which is peculiarly gratifying to cattle.

In general, however, it is to be observed that, when the quantity of hay is augmented with a view to the diminution of the corn, although horses will thereby acquire more fat than upon the same proportion of grain, yet they are less equal to the efforts of hard work; whereas, if the corn be increased and the hay diminished, though the cattle may appear to grow thin, yet their flesh is more firm, they are capable of greater exertion, and are in what is usually termed 'better condition.'

Soiling.

With respect to the advantages of *soiling horses on green food*, in the yard or stable, it seems to be now generally understood that, with proper management, they can be supported with great health and vigor: its economy, however, must depend on the proportion which it bears to the price of dry food, and its convenience to the quantity in which it can be spared for other cattle.

It is a very old, though by no means a universal practice,† and the experience of hundreds of farmers proves, that horses maintained in that manner for years have neither lost flesh nor strength sufficient for all farming purposes, although there was no palpable saving of their work, and that, though afterwards placed on dry food during the winter, they continued in perfect health, It is an excellent plan to give some green food along with the corn and chaff, before the usual period of feeding entirely on dry fodder: the change from dry to green, and again from green to dry food, should be gradual. In its commencement, the clover or tares should be cut, and mixed in small portions with straw, and a proportionate quantity of corn should be reduced. The green food is then insensibly increased, until the corn is entirely omitted, and the quantity of green meat is supplied without limitation: it should, however, be cut over-night, and given only in small quantities gradually increased, to guard as much as possible from accidents, which may arise from its succulence by hoving. When horses are soiled, they never should get much at a time, a practice far too prevalent among servants.

The *summer feeding of horses* was formerly confined to pasturage; but of late years the practice of soiling has become very general. The benefit of grazing consists in its requiring little attendance; and being the most natural, and therefore the most healthful, it is preferable for all young cattle which can be spared from constant labor, and on farms which contain a considerable portion of rough pasture. But for horses at regular work, these advantages are counterbalanced by the time lost in getting them up from the field; the indisposition to labor which they acquire by being at large; and the annoyance which they suffer from heat and flies when turned out in the day-time. The value of their dung and urine is also in a great measure destroyed by being scattered upon the surface of the ground, and exposed to exhalation of the sun and wind; and there is much waste of grass, and injury done to the mellowness of the soil, if it be valuable land, by the treading of all heavy stock, but especially of horses. The utility of soiling consists in a more economical consumption of grass, whether natural or artificial, than by grazing; in the accumulation of manure, and in the quiet and coolness which the cattle enjoy under sheds, or in the stable, during mid-day, as well as in their being always ready when wanted: the only disadvantage is the expense of cutting and carrying home the grass, against which may be fairly set the increase of manure, if expense be really incurred; but as during summer, there is usually a long interval of rest between the morning and afternoon work, the carters can then cut the necessary quantity, which may be drawn to the homestead by one of the team-horses, if there should not be a supernumerary one left for odd jobs.

When, however, the economy of the practice is not the chief consideration, horses on summer work may be both *grazed out and soiled.* They may be put on cut clover in the middle of the day, between yokings, and turned out during the night into a well-sheltered meadow or enclosure. In being kept under cover during the heat of the day, they will be sheltered from flies, and will feed more at ease; and in being pastured out during the night, they will also have an opportunity of selecting those grasses which act as condiments and are most agreeable to their palate. All animals like variety of grasses, selecting always what is most palatable, which they cannot do when soiled, particularly if fed on cut clover or tares. Exposure to the night air is also found to be highly favorable both to their health and appearance.

The economy of soiling, wherever it can be conveniently adopted, is, indeed, too generally admitted to need the support of argument; and particularly on soils on which turnips are entirely consumed on the ground, or on which they cannot

* Professor Von Thaer, of the Royal Farm and College of Agriculture, established by the King of Prussia, at Moegelin, near Francfort upon the Oder. The translator of his work—the Baron de Crud—calculates that a horse consumes one-eighth less of meadow-hay than of that made from the artificial grasses.—Vol. i. p. 162, note.

† It is mentioned in a treatise on Agriculture, entitled 'Hartlib's Legacy,' so long ago as 1650, p. 245.

be grown, and where, consequently, there is difficulty in converting the straw into manure during the winter, it cannot be too strongly recommended. But it requires a succession of green crops; and as only the artificial grasses are resorted to in England—though in many parts of the continent the meadows are also mown for that purpose—it is necessary that winter and summer tares should be sown at different periods, so as to afford a constant supply, both before clover comes in, and after the first crop is off. This is a great impediment to the practice in Scotland, and in some of our northern counties, where tares are an uncertain crop; though cattle are certainly soiled with great advantage, both there and in other places, on clover alone. In other situations too, farms, on strong clay, frequently contain a large portion of meadow, and grazing being combined with tillage, the whole of the straw is consumed in the winter, in which case one of the chief advantages of summer soiling would be lost, as yard dung, without the addition of straw, is of very little value. But even in this instance, or in others where the distance of the fields from the homestead may be opposed to the cartage of the grass, it is better to cut it daily, and give it on the ground in pens, or small inclosures hurdled off, so as to prevent the cattle from injuring the growing crop, than to allow them to range over and trample it. By confining them in this manner to a small space, and moving the hurdles forward as the grass is eaten, the fertilizing properties of the dung and urine, which would otherwise be lost, are in a considerable degree preserved; and if the land be immediately ploughed, it will be nearly as much benefited as if it were more regularly manured.

The artificial grasses used for soiling are the same as those already enumerated as hay, but here *tares* take the lead, both because the winter species is earlier ready than any other, except rye-grass, and affords a weightier crop. In most seasons, tares are ready for the scythe towards the middle of May, for if left till they are quite ripe they will become unfit for soiling before the crop can be used; and although there may be some loss in using them so soon, it will be compensated by the saving at the latter end, as well as by commencing the soiling sooner than would be otherwise practicable. Before they are off, clover will be ready; the tares still standing may then be made into hay, and by the time the clover is becoming strawy, and losing its succulence, spring-tares will come in, which, if they have been sown at intervals of about a fortnight each, will last until the second cut of clover: or, if spring-tares be not sown, the growth of part of the clover may be checked by light early feeding. There is also an excellent fashion regarding soiling in Dorsetshire, which consists in saving a portion of rye alone, to be cut green; then another portion of rye, with tares; and afterwards the remainder entirely with tares: the rye comes first into use, and assists in raising the earlier tares, while those of later growth do not require any such nursing. Thus horses may be kept upon a succession of green herbage, without touching the meadows, throughout four months of the summer and autumn, and, while thus fed, require very little corn; when stirring the fallows, and during the hurry of harvest a couple of feeds a day may be serviceable, but more is unnecessary, and at other times should be wholly omitted.

The mention of *lucerne* has been omitted, although extremely valuable for soiling, because it requires a peculiar quality of land, and is not commonly cultivated. In the Essex Report, it is said, that two horses have been supported during four months upon a quarter of an acre, with scarcely any thing given to them besides; and that six horses, at hard work, have been kept on lucerne, instead of hay, but with an allowance of oats and chaff for twelve weeks—six from the first cut; four from the second; and two from the third: which, valuing the hay saved at 3*s*, per horse per week, would amount to £10 16*s*.* A paper in the communications to the Board of Agriculture also states that, in one year, twenty-three horses have been kept twenty weeks, and in the next, twenty-eight horses during eighteen weeks, upon eleven acres alone; which gives an average of three roods per horse in nineteen weeks.† It is also extensively used on the coast of Normandy, and in the neighboring islands of Guernsey and Jersey; but it is there said that horses, particularly those used for the saddle, require more precaution from overworking, when first going out of the stable, than when fed on other hay; and, what is singular, that when soiled on green lucerne, there is not the same danger.‡

In Holland and Flanders, where the feeding of cattle is supposed to be better understood than in most places, the summer soiling of farm-horses is limited to half an acre of meadow grass, cut and carried to the stables, from the middle of May to the middle of June; from which time to the end of August one-sixth of an acre of clover is added, with 2 lbs daily of beans; and from thence to November, when the winter feeding commences, the clover is replaced by an equal quantity of carrots. From the number of horses stated, in this instance to be kept in proportion to the tillage—11 to 150 acres, of alluvial soil—their labor can, however, be only light; though a pair is said to draw a ton and a half of manure in the field, and three tons upon pavement.§

Accounts have been also published, showing that horses may be regularly worked throughout the summer, in this country, without any corn: thus green crops, consumed by soiling, are said to go four times as far as when grazed; and that, in this manner, one acre of clover is equal to six of meadow pasture. But many of these statements rest only upon opinion, or upon insufficient data, and in all, so much depends upon the state of the crop, the size and health of the animal, and the work performed, of which the account is generally imperfect, that no safe conclusion can be drawn

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*Young's Survey of Essex, vol. ii. pp. 71, 72.

† Vol. vii. Art. 25. Part I.

‡ Quayle's Survey of the Islands on the Coast of Normandy, p. 117.

§ Radcliff's Report of the Agriculture of East and West Flanders, p. 216. Another farm, of 200 acres, mentioned in the same Report, is cultivated by eight horses, each of which get daily, in winter, 15 lbs. of hay, 10 lbs. of straw, and 8 lbs. of oats; and, *after* every feed, a bucket of water, 'richly whitened with rye or oatmeal:' in summer, clover is substituted for hay, but the other feeding remains the same, and the '*white water*' is never omitted.—p. 54.

from them: it is therefore unnecessary to refer to them; nor is the cause which they are meant to promote assisted by being advocated upon any other than its real merits. A medium-sized farm-horse, at customary labor, consumes from 84 lbs. to one cwt. of green food daily, with an occasional allowance of corn. Now a good acre of tares, or of broad clover, will weigh twelve tons, (that is, presuming the tares to be cut only once, and the clover twice*; for although winter tares may be cut again, it is more usual to get them off the land as soon as possible, either in order to sow turnips, or to form a bastard fallow;) and, taking that weight as the average of both, and the consumption at the highest rate, half an acre of either would support a horse during four months. This nearly accords with some instances in the county surveys; in others, more have been consumed, and for the reasons already stated, it is next to impossible that any two accounts should agree; but, upon a rough estimate, it may be affirmed, that about a perch per day will be required for each horse in most seasons, and on most kinds of lands, if soiled, and that double that quantity will be necessary if pastured.†

It must, however, be borne in mind that the difference in the degree of succulence contained in various grasses must necessarily have a material influence on the state of the cattle by which they are consumed. Of this farmers are generally pretty well informed, either through their own observation, or by the experience of others; but an accurate acquaintance with the subject was not attained until the experiments made at Woburn, by which Mr. Sinclair has been enabled to ascertain the quantity of soluble nutritive matter afforded by all those grasses which constitute the produce of the richest ancient pastures, as well as those of artificial growth, and which will be fully adverted to in a future portion of this work.

The custom of giving corn along with green meat is unprofitable; for the grain, thus mixed, passes rapidly off the stomach, and is never perfectly digested. When, however, increased exertion demands an addition of more substantial food and that corn is also allowed, it should be given only in the morning and at night, accompanied with a sufficient quantity of chaff to afford it consistence, and green meat should only be given at mid-day. Farmers very generally omit that precaution, and it is a common custom among them to allow half the usual quantity of corn, without regard to the effect of the watery juices of grass upon the digestion; but they may be assured that a great portion of the nutriment contained in the grain is thus wasted.

Winter Food.

It cannot be doubted that working horses can be supported during the autumn and winter, until the growth of the young grasses, with only roots and hay, and plenty of hay and straw, without giving them any corn. But, although they can be maintained in perfect health and apparent vigor, yet they will be incapable of any strong or unusual exertion. Perhaps the most wholesome root, and that most relished by them, is raw carrots, without the tops, and then coarsely washed and sliced. Although, as we have already seen, potatoes have been advantageously used, yet it must be admitted that they are thought to occasion a certain want of spirit and flabbiness of flesh, which probably arises from the use of boiled food. It is also well known that, in many other cases, animals have refused even to taste them. This, however, has probably arisen from some want of care in the preparation—for, if boiled too soft, or in a mashed or wet state, they will not be eaten by horses: they should therefore be always steamed, and daily fresh dressed, nor should any other than the floury sorts be chosen. There is also some management requisite in getting horses to change their taste for any kind of food with which they are unacquainted: thus, a new species of root should be given in a small quantity by hand, when there is nothing else to eat, and apparently to coax them: when they relish that, a portion may be mixed with their other food, and in that manner they will be induced to overcome their dislike.

The *cavalry allowance* of hay and oats to horses in barracks, is 12 lbs. of the former, and 10 lbs. of the latter, on which they are kept in high condition; but it has been ascertained by experience, that a common cart-horse cannot be supported in good working order on less than 28 or 30 lbs. of the same food, or more, if straw be substituted for any portion of the hay, supposing him to be of a medium size, and only employed on the customary farm labor; when greater exertion is required even that is insufficient. In some of the brewers' and coal-merchants' stables in the metropolis, the common allowance amounts to 36 lbs. of dry food daily; and in those of Messrs. Wiggins, the great cart-horse contractors, it varies from 36 lbs. to 40 lbs., according to size and work, in the proportion of 16 lbs. of clover or sainfoin hay, and 4 lbs. of straw to 18 lbs. of grain, consisting of oats or barley, beans or peas, and 2 lbs. of bran. The corn being given by weight, no difference is made in the amount of the allowance whatever kind may be used, and the choice depends more on price than on any settled rule; except that oats are preferred to beans in summer, and that rather more bran is allowed with the latter. Salt is not given regularly; but much benefit has been derived from the occasional use of carrots and Swedish turnips sliced along with the chaff.

The whole of this food is given as *manger-meat*, no part of it being put into the rack. The hay and straw are cut very short; the beans are bruised, and the oats sometimes coarsely ground; but it is

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* From an experiment made at Woburn, the green weight of an acre of broad clover was found to be 49,005 lbs.:=21 tons. 17 cwt. 2 quars. 5 lbs.; but the soil is described as a rich clayey loam, and the crop cannot be assumed as an average. See *Sinclair's Hortus Gramineus Woburnensis;* and the *Appendix to Sir H. Davy's Elements of Agricultural Chemistry.*

† In one instance it is stated, that twenty horses have been supported for three months on six acres of tares *(Rutlandshire Report*, p. 71;) and in another, that fifty-one heads of cattle—cows, oxen, and horses—were kept, during that period, on 15 1-2 acres of mixed herbage; or, in each, about half a perch per day. *(Comm. to the Board of Agriculture*, vol. vii. part 1, art. 1.) A third mentions, that twelve horses and five cows, which, together may be considered equal to eighteen horses, consumed, in the same time, eight acres of tares, or 3 quarters and one-thirty-second part of a perch each daily *(Middlesex Report*, p. 257;) and a fourth states the allowance of *pastured tares* (for twelve horses) to be an acre per week, or nearly two perch each day. *(Essex Report*, vol. ii. p. 354.)

found most advantageous to wet the barley, and allow it two or three days to sprout. The chaff is cut by a horse-mill, which at the same time bruises the beans by a small addition of machinery, and one horse with a couple of lads, one to unbind and deliver the hay, and the other to fill the trough, will cut a load of hay in three hours. The machinery, which consists of nothing more than a common chaff-cutter, of somewhat larger size than those used by hand, and a bruising apparatus of very easy construction—both of which may be readily added to a thrashing-mill—works in a loft above the horse-course, on the floor of which the whole provender is afterwards mixed: the chaff being spread first, next the bruised corn, and lastly the bran, the whole is united in one mass; and having been separately weighed, is then measured off in distinct portions.

The horses, thus fed, are however, of the largest size, and being used for drawing very heavy weights, consequently require more sustenance than the common run of farm cattle, for which the amount of dry food already stated—28 lbs. to 30 lbs. will generally be found sufficient. Taking the latter quantity, a suggestion published in the 'Sporting Magazine,' and recommended to the attention of farmers, is deserving of notice, as furnishing some useful hints, founded upon long experience of an eminent medical gentleman, in feeding light draught horses, which undergo very considerable fatigue in constant journies, at a rapid pace, and yet, on that allowance, are kept in perfect working order. The ingredients of the food are divided into four classes, containing different quantities of each, to be used as discretion or convenience may dictate, in the following proportions:

	1*st.*	2*d.*	3*d.*	4*th.*
	lbs.	lbs.	lbs.	lbs.
Bruised, or ground beans, peas, or white corn	5	5	10	5
Hay cut into chaff	7	8	10	8
Straw, do. - -	7	10	10	8
Steamed potatoes -	5	5	—	—
Malt-dust, or ground oil-cake	—	2	—	2
Brewers' grains -	6	—	—	—
Bran - - -	—	—	—	7
And 2 ozs. of salt to each*	30	30	30	30

The weight of each class is 30 lbs., and the quantity of nutritive matter contained in their ingredients is supposed to be equal. The first and second classes, of which potatoes form a part, are however preferred by Dr. Sully, though the grains had the oil-cake with which they are combined do not appear to form an adequate substitute for the difference made in the allowance of corn. Of *grains*, it may also be observed, that their too frequent or copious use has been found so injurious to horses, that those of brewers, when so fed, are said to become rotten and die in a few years; and on dissection are found to have large stony concretions in their bladders.†

As to the *salt*, the propriety of its *daily use* is open to question. That it contributes to the health of animals, is a fact too well established to admit of doubt; but the manner in which it acts upon their constitution—whether by merely aiding digestion, or by cooling and correcting the impurities of the blood—has not been sufficiently ascertained to fix with certainty either the mode, or the amount of its application. Numberless experiments on this subject have, indeed, been recorded, all tending to prove that it is relished by cattle, and improves their condition; yet, still the quantity to be administered to each, the time when it should be given, and its precise effects, remain to be determined, and can only be defined by more accurate trials than have been yet made. In this, however, as in all matter regarding the treatment of animals, nature, when she can be consulted, is ever the surest guide. The tastes with which she furnishes her creatures, instinctively direct them to those kinds of food which are the most nutritive and the most healthful; but, although most animals in a wild state evince a taste for salt, it yet is only occasionally, and not regularly, indulged. The 'salt licks' of America, which are masses of mineral salt, so named because they are licked by the beasts of the forest, afford abundant evidence in the excavations which have been thus made, that salt is essential to animal health: the elk, the deer, and the buffalo, traverse immeasurable wilds in search of them, and tracks are found leading directly to them from the remotest pastures. But the instinct which leads those animals to seek the 'licks' and 'salt springs,' in which they are even said to bathe, is only periodical; the impulse once obeyed, they retire to their usual haunts, nor return until the recurrence of the same season. This, singly, would go far to show that salt is only useful as a preventive of disease, and should be only occasionally administered in large doses; but there are so many other well-attested instances of animals which thrive upon the constant use of saline plants, and of water impregnated with salt, that it cannot be considered as amounting to proof. That it is not hurtful when given moderately, in any way, is certain: but whether it should be employed in small quantities daily, or to the extent of half a pound at a time, for horses, and only once a week, or whether the practice should be confined to summer, is not so clear: perhaps a better mode than either would be to place a lump of rock-salt in a corner of the manger, and allow the horse, after having made him acquainted with its taste, to use it at his pleasure.

The points most worthy of imitation in this gentleman's management are the *order and economy of his stable.* He justly observes, that grooms are wasteful of hay, and by allowing the horses an unlimited use of it, tempt them to eat too much: his stables, therefore, are without racks: the loft above contains the machinery for cutting and grinding the chaff and corn, and when prepared, each horse's provender is put into a tub, from which a tunnel leads to the manger underneath, by means of which it is conveyed to him without further trouble. It is given in small quantities at several times during the day, and at night enough is thrown into the tub to last until the morning. This is a most excellent plan, and might be still further improved by a contrivance in the tunnel to prevent more from descending than the horse will eat at one time.

The method of converting the entire provender into manger-meat has been borrowed from Flan-

* Letter from Dr. Sully, of Wiveliscombe.—*Sport. Mag.*, vol. xix. p. 15.

† Middlesex Report, 2d Ed. p. 469.

ders, in which country it is the universal practice, and the farm-horses are invariably in high condition. Its value consists—

1st. In its requiring a more thorough mastication of the food than when it is given in the common way, thereby assisting digestion, and consequently promoting the nutrition of the animal; for, it is not only true that old horses lose much of the power of mastication, and that young and greedy cattle are apt to devour a considerable part of their corn entire, when it is given alone, which passing through them in the same state, affords no kind of nourishment, but all animals are known to derive nutriment from their solid food, in a certain degree, in proportion to the care with which it is chewed.

2nd. It is consumed in less time.

3d. By the mixture of the materials, some portion of which, as damaged hay, or straw, might be refused if given separately, an equal consumption of the whole is secured.

4th. By its admitting of being more readily weighed, or measured, than when given separately, it can be more accurately distributed to each horse; on which it may be observed, that more injury is often done to horses by allowing them an unlimited quantity of rack-meat, than even by stinting them to a scanty allowance; for they will not only pass whole nights in eating, when rest would do them more service, but, by this extraordinary distention of the stomach, its powers are weakened, and their general health is injured.

5th. It prevents waste, and consequently it goes farther.

Many exaggerated accounts of the saving thus made have been published, some of which state it as high as one-third, others even one-half, of the rack-meat: these are only calculated to mislead; or, by their improbability, to cast a doubt upon the testimony of those who have made such statements; but, according to the opinion of Messrs. Wiggins, whose business extends to the daily feeding of more than three hundred horses, it may be fairly estimated at one-sixth. These advantages are so obvious, that it is unnecessary to press them upon attention; but it must be admitted, that the practice is attended with the inconvenience of occupying more of the carter's time,—independently of that employed in cutting the chaff—than the customary method; for horses being apt to blow upon manger-meat, and then to reject it, when given in a large quantity at one time, it must be administered with a sparing hand, and renewed when the manger is empty, thus requiring constant attendance until the last feed is put in.

Before quitting this subject, it may not be irrelevant to advert to the custom of giving *oats in the straw*, cut together, which, although recommended by some eminent agriculturists*, and common in many places—especially in East Kent, where it is mixed with the barn-chaff, provincially *'taff and chaff, and colder,'*†—only deserves notice in order to be reprobated. Throughout the greater part of that country, the regular mode is to employ a a man and a mate to each team of four, when two turns of work are made in the day. The time of going to work is six in the morning, returning at ten, and then going out again at one until six: nine hours in the whole. It is the carter's business to bait the team from four in the morning until six, and the mate takes that duty during noon, and from six till ten, when the stable is shut for the night. The food is wholly cut into chaff, and the corn, whether beans or oats, *cut with it in the sheaf.* The only advantage attending the practice of cutting the oats is the paltry saving of thrashing, while it precludes all knowledge, beyond a vague guess, of the acreable produce of the crop, the quantity of corn for the whole number of horses, or the share which falls to each, and it may be confidently pronounced a slovenly and unfarmer-like practice.

* Parkinson: *Essay on Live Stock*, vol. ii. p. 168. Middleton: Survey of Middlesex, 2d Edit. p. 462.

† Kent Report, 2d Edit. p. 183. Complete Grazier, 5th Edit., p. 175—177.

Nutritive value of Food.

The next consideration is the *relative nutritive value* which the different kinds of *winter food* in common use bear to each other. Although chemistry has enabled us to ascertain the component parts of vegetables, and it may be presumed that the worth of all articles of cattle-food is in a great measure proportionate to the quantity of soluble, or nutritive matter which they contain, yet it has not clearly demonstrated that such proportions actually denote their exact degree of merit. The essential elements of vegetables consist of what chemists call hydrogen, oxygen, and carbon, in various proportions, combined in some cases with a small quantity of azote, and the different combinations of all these produce gluten, or albumen, saccharine matter, mucilage, and starch. Gluten, which is the most nutritious, is nearly allied in its properties to animal substance; saccharine matter may be considered as possessing those of sugar, and mucilage those of gum; there is also an extract which is not supposed to contain any nutritive matter, but has been found useful to animals in a medicinal view. According to an analysis, made by Sir Humphry Davy, of the amount of those substances found in 1000 parts of different kinds of corn and pulse, it appears that the following are their proportions in those employed as food for cattle.

GRAIN.	Whole quantity of soluble, or nutritive matter.	Mucilage and starch.	Saccharine matter, or sugar.	Gluten or Albumen.	Extract or insoluble matter.
Norfolk barley,	920	790	70	60	—
Yorkshire rye, -	792	645	38	109	—
Scotch oats, - -	743	641	15	87	—
Common beans,	570	426	—	103	41
Dry peas, - - -	574	501	22	35	16 *

But these results have been obtained by experiments made through solution in water, and it is not improbable that both the action of chewing the salavia, and the solvent juices of the stomach, may have a very different effect upon the food when it is eaten; for they are more beneficial in their joint operations than mere solution by com-

* Elements of Agricultural Chemistry, 4to. p. 131.

mon water, and the properties of grain are known to change, or to be lost, in the processes of malting and baking. It is also possible that certain combinations of those substances may be more nutritive than others; and therefore, although the chemical tests have thrown considerable light upon the subject, they yet cannot be deemed conclusive. There appear, indeed, to be about as many varieties of extract as there are species of plants: the difference of the properties probably in many cases depended upon their being combined with small quantities of other vegetable substances, or to their containing different saline, alkaline, or earthy ingredients. It is probable that the excellence of the different articles as food will be found to be in a great measure proportional to the quality of the nutritive matter they afford; but still their quantities cannot be regarded as absolutely directing their value. Experience, however, which is the farmer's surest guide, has to a great extent confirmed the accuracy of the analysis, and has in this instance added one more to the many existing proofs of the assistance which husbandry derives from science.

On reference to the table, it will be seen that oats are greatly superior in nutritive matter to beans; but this must be understood with regard to their respective weight, for, used as they are in England, by measure, and taking the average weight of a bushel of common horse-beans at 56 lbs. and of Scotch oats at 40 lbs., the difference between the two will be as 31,920 to 29,720, or nearly 16 to 15 *per bushel*, in favor of beans. The same remark will nearly apply to the relative value of peas; with this distinction, however, that as they contain less gluten than beans, they are perhaps neither so heating, nor so nutritive; and experience has shown them to be more flatulent.

The *difference in weight* of the various grain used in feeding horses is not in general sufficiently considered. Most people look only to the prices, and finding beans at perhaps 5*s*., when oats are only at 3*s*. 6*d*. the bushel, they conclude that the latter are cheaper in that proportion; without reflecting that, were the bushels weighed, the prices would be found nearly equal, and that, were feeding regulated by weight, the cost of either would be about the same.*

The custom of *feeding by measure* has led to a prevalent idea that beans are more nutritive than oats; though, weight for weight, we have seen that the contrary is the fact; and both that and the heating quality ascribed to them has probably arisen as much from the greater amount in an equal measure, as from any other cause; for, although it would appear that a bushel of either contains nearly an equal portion of nutritive matter, yet bulk, or weight, is also of importance in feeding, and it is certain that, in practice, an equal measure of beans is superior to the same quantity of oats. It also occasions constant irregularity in the common feeding with oats alone; for these vary in weight, according to soil and season, from 30 lbs. to 42 lbs., and even more, per bushel: thus a quartern of good feed oats, which ought to weigh 2½ lbs. is often reduced to 2 lbs., and though the horse is thereby deprived of one-fifth of his corn, yet, the same measure being thrown into the manger, the fact is seldom adverted to.

The following table* will show the quantity of meal that is usually extracted from certain weights of that grain; and, though different results may be obtained by various qualities and seasons, yet the progressive ratio of the produce will generally be found nearly similar:—

Weight per bushel avoirdupois.	lbs.		lbs.	oz.		lbs.	oz.
	42	produce in meal	25	2	ditto in husk	16	14
	40	"	23	6	"	16	10
	38	"	21	12	"	16	4
	36	"	20	3	"	15	13
	34	"	18	11	"	15	5
	32	"	17	5	"	14	11
	30	"	16	1	"	13	5

Rye is very generally employed as horse-food in North America. It is there given coarsely ground, and sprinkled over straw and clover chaff, previously wetted, by which means the whole mass is well incorporated; mastication also is so much assisted that no part is wasted, and the condition of the carriers' horses on the roads in Pennsylvania, where they are universally thus fed, and are seldom lodged in a stable, proves the excellence of the practice. It is also used in Germany; but generally in the shape of bread made from the whole flour and bran, and it is not unusual in travelling through some parts of that country, and of Holland, to see the postilions help themselves and their horses from the same loaf. The plan of giving bread to horses was formerly adopted in some racing-stables in England, and the statute-book contains many acts of parliament regulating the making of horse-bread. In later times wheaten bread of the finest quality was used, from an idea that the superior weight and value of the grain, and its well-known nutritive power, when the flour alone is converted into bread, would render it more invigorating than oats: but the experiment did not succeed, and it furnishes one among many proofs, that reasoning from analogy alone will sometimes lead to erroneous conclusions.

Barley is rarely used in this country for horses, and rye perhaps never, or only by chance; yet throughout the south of Europe, the former along with straw, is the only food given to horses and mules, the latter of which go through very severe labor, and are generally in high condition. There are various opinions concerning its properties—some considering it as more heating, others as more cooling, than oats, and all perhaps equally ill-founded. Where constantly used, it is not seen to have any prejudicial effect; and, as it appears to contain a larger portion of nutritive matter than oats, and is known to be more fattening, it is well worthy of attention, especially as the price is so much affected by mere color, which is of no importance in feeding, that inferior malting samples frequently fetch little more than feed oats of good

* Taking for the sake of round numbers, the average price and weight of oats, at 3*s*. 4*d*. and 40 lbs. per bushel, they would be worth a penny the pound; and the relative value to them, of other grain used as horse-food, at their common average weight, when of equally good quality, would be,

	Oats.	Common Tick beans.	H. beans.	G. peas.	Barley.	Rye.
Weight	40lbs.	60lbs.	56lbs.	60lbs.	50lbs.	52lbs.
Price,	3*s*. 4*d*.	5*s*. 0*d*.	4*s*. 8*d*.	5*s*. 0*d*.	4*s*. 2*d*.	4*s*. 4*d*.

* Survey of Antrim, p. 183. See a future chapter, on the cultivation of oats, in this publication; and also the Farmers' Magazine, vol. xvi. p. 188, vol. xvii. p. 413, and vol. xx. p. 308.

quality. Six bushels have been found, on comparative trial, to be equal to eight of oats.*

The British cavalry was fed on barley during the greater part of the Peninsular war, and throve upon their allowance, though it was *delivered by weight*, and was only 10 lbs. instead of 12 lbs. of oats; the barley being considered in that proportion more nutritive than oats, owing to the smaller quantity of husk.

Now it follows from this, that we have no guide on which we can more securely rely than the weight of vegetable nutritive matter to regulate its consumption. Yet it has been contended that, in the feeding of farm-horses, barley—though heavier than oats, and containing a larger quantity of extractive matter—does not contain so much nutritive substance. It is said to be more watery, and therefore, if given weight for weight, to deprive horses of a portion of their regular nutriment. An article in the 'British Farmer's Magazine,'† indeed, states the saving on feeding with barley as amounting to £6 per annum, for each horse; but that grain was given, instead of oats, by weight, without any distinction between the respective nutritive qualities of either; nor does it appear whether the statement was made from the actual experience of an entire year, or was only assumed to amount to it, from a calculation made on the savings of a shorter period.

An account of its uses, in many instances, by Sir John Sinclair,‡ states its being almost uniformly given with one-third of beans, bruised or broken with the barley, or boiled, which is considered the better plan; though it certainly was not boiled for regimental service, nor is the proportionate quantities of barley and beans to oats stated: we are also led to believe that the former have been in most cases given by *measure*, in consequence of the cheaper price of barley. *Bere*, or *Big*, we also know to be sometimes substituted with economy for oats in the north, but the difference of weight is not considered: in Norfolk, too, Marshall tells us that, when barley is unsaleable at regular markets, it is sometimes given to horses, in which case it is usually 'malted,' that is, steeped for a few days until it begins to vegetate, in which state it is thought to be less heating than when given in the natural state. Being also frequently badly harvested, the pernicious effects of heat, or must, are prevented by boiling.

We will not hazard an opinion on the proportionate value of oats and barley, which can only be fairly tried by first depriving two horses for some days of any kind of corn, and then feeding them for a considerable time upon equal weights of each grain; but we certainly do feel somewhat sceptical about the value so loudly insisted upon of late, of *boiled corn* as food. That postmasters' horses, which get an unlimited quantity, may be benefited by it, we will not deny; and a mash of boiled barley twice a week will be found to improve the general health of the animals, as evinced by the sleekness and glossiness of their coats, as it certainly has an opening and cooling effect on the bowels, which cannot but be serviceable when lare quantities are consumed of heating food; but we may be permitted to doubt either its necessity or its utility for farm-horses, commonly fed: or that they require, in the winter months, more cooling food than a bran mash, instead of their corn, with an ounce of nitre, or common salt, on the Saturday night.

There is also a fact stated upon the authority of Sir John Sinclair, respecting the heating effects of unusually large quantities of corn upon the health of horses, which is well worthy of attention. It is that of an extensive coach-master, who regularly allowed three bushels of oats daily to each of his sets of eight horses, out of which, during the course of many years' experience, he annually lost a great number. Upon reflection, however, he changed his mode of feeding, and allowed instead for each set,—

1 bushel of beans,
1 ditto oats,
1 ditto hay and straw cut into chaff;—

the consequence of which was, that his horses were as hearty and as able to perform their work as they were ever known, and that he has only lost one since the adoption of that plan.*

In gentlemen's stables no other than *meadow-hay* is generally admitted, and it is in all respects the best; but farmers find more profitable uses for it, in the feeding of fatting stock and cows; and clover, either alone or with rye-grass, sainfoin, or tare-hay, though coarser, answers every necessary purpose for farm-horses, more especially when cut into chaff and used along with straw. *Sainfoin* is commonly esteemed the first, and *clover* the next in quality, but *tare-hay*, if well made, is very hearty food: they are, indeed, so nearly alike, that it is unnecessary to dwell upon their peculiar properties, and, were there even greater difference between them, there is seldom much room for choice, as whatever may be the produce of a farm, it must be consumed, and no one thinks of purchasing fodder for the working cattle.

Expense.

From the foregoing statements, the necessary information may be collected as to the quantity and kind of food on which farm-horses may be supported at constant labor. They lead also to the important consideration of the *annual cost of a team*, and of the labor it may be expected to perform, without an accurate knowledge of which no correct estimate can be made of the general expenses of cultivation, or of the particular charges on separate crops.

The quantity of the different articles of food, in fact, depends on the size of the horses and the labor they perform; the value, upon the prices of different seasons, and in every season upon the situation of the farm in respect to markets, particularly hay and roots, which bring very different prices at large towns, and at a few miles distance. It is for these reasons that the yearly expense of

* *Marshall's Minutes of Agriculture*, Digest, p. 43. In another experiment, besides that mentioned in the foregoing table, Sir Humphry Davy states the difference between 100 parts of oats and barley to be—

Fine Norfolk barley	79 Starch	59	Sussex oats	
	6 Gluten	6		
	7 Saccharine matter	2		[Lect. III.]
	8 Husk	33		*Elem. of Chem.*
	100	100		

† No. IV. p. 486; but see also No. V. p. 657.
‡ In the British Farmer's Magazine, No. XI. p. 171.

* Scottish Husbandry, vol. ii., Append. No. 23.

a horse's maintenance has been estimated at almost every sum, from £15 to £40. In the Lancashire Report,* the cost of a team of three, ploughing seven statute acres per week the year throughout, is thus estimated:—

	£	s.	d.
Oats, six bushels per week for six months, at 23s. per quarter - - -	19	10	0
Three ditto - six ditto -	9	15	0
Hay, six months at £1 1s. per week -	27	6	0
Grass and green food 15s. per ditto -	19	10	0
Wear and tare of two ploughs - -	3	3	0
Shoeing, 10s. 6d., and farm expenses 5s. each - - - - - - - -	3	6	6
	£81	10	6

In the General Report of Scotland,† the feeding is calculated on some farms as high as 15 quarters of oats each, with 22 lbs. of hay, or an English acre of clover or tares, and a quarter of an acre of potatoes, yams, or Swedish turnips while they are on straw, and thus the expense of keep—oats being 25s. per quarter—is estimated for a pair at—

	£.	s.	d.
Interest on purchase, decline in value, and insurance from disease -	15	12	0
Food - - - - - -	73	2	6
Harness, shoeing and farrier -	6	0	0
	£94	14	6

Mr. Brown, of Markle, makes the charge of a plough-team of a pair, with driver, amount to‡ - - - - -	135	1	0
Mr. Keer, of Berwick§ - - - -	120	0	0
While others reduce the charge of a pair and driver more reasonably to¶	90	0	0
And others again to‖ - - - -	80	0	0
Mr. Middleton, of Middlesex** raises it to - - - - - - - -	157	10	0

But these estimates were made at various periods, when great difference existed in prices; the Middlesex report is rather meant for the road than for common plough-work; and perhaps the present general average of the kingdom, exclusive of the charge for interest, may be calculated at about £84.

Some farm-horses, though working at the usual rate of common labor, are said to be supported during the summer on cut grass, almost without corn. 'When no beans are grown, their winter food is oat-straw or hay; but in all other cases, bean-straw alone forms their winter provender, from grass to grass, with a mess every night of bean-chaff, potatoes or turnips, and a little small corn, all boiled together and seasoned with salt; and two feeds of oats per day, but only when hard worked.' †† On this fare they are stated to be kept in excellent condition, and others are said to consume only from 15 to 25 bushels, if good oats are given; but as draughts *(light corn)* are commonly used, the quantity is proportionably increased. Now, if the meaning of this be, that a cart-horse gets no more than that quantity in one year, it must be either made up of other nourishing food, or he must be so badly fed as to be unfit for work. And, notwithstanding all that has been said of substitutes for grain—although admitting that roots may be economically and even healthfully substituted—we must beg leave to doubt this possibility when the animal is forced to exert himself to the extent of his power. In proportion to the work which he usually and regularly exerts, he may be in excellent apparent order: but push him; try him with a few days' harder than ordinary toil, and you will find that it is not an additional quantity of roots, but of sound corn, that he requires to sustain him. The reason is evident: he may fill his stomach with roots, but they will not supply the quality of invigorating and nourishing substance which corn supplies *in the same weight;* and having filled it, he can do no more. Therefore, we repeat, that farm-horses moderately worked may do their regular days' labor with perfect satisfaction to their employer; but compel them to the full extent of their vigor, and there will be no advantage found in stinting them. When working cattle, more especially horses, are not judiciously as well as economically fed, they are either suffered to go out of condition, or provender is unnecessarily wasted; and thus, in either case, considerable injury is sustained through their deficiency of strength to perform their proper quantity of labor, or through the unnecessary expense of their keep.

Some years horses require more corn than in others; sometimes soiling commences sooner than at other seasons; and at others, from the failure of the second crops of grass, they are sooner put on hay and corn. The hay, too, has not the same succulence in some years as in others, and consequently will not go so far; and horses, like other animals, though of the same apparent strength, do not all consume similar quantities of food.

In treating this subject minutely, it would be necessary to review the various methods of feeding horse-teams, practised by different eminent farmers, but, besides that, the enumeration would be tedious, few men require such assistances to their judgment in forming an opinion of the most eligible mode, and it may be sufficient for the present purpose to assume that plan which can be most generally adopted, namely—of feeding upon corn and hay, or straw, during the winter, and soiling in summer; leaving out of the question the savings which may be made by the most economical employment of roots. Five horses will also be assumed as composing a team; for, even if ploughed in pairs, three are sometimes wanted for other work; an odd horse is always useful; and with the aid of the farmer's own nag to hook on occasionally to a third plough, a couple of hundred acres of medium soil, under a moderate rotation, and with a fair proportion of meadow, may be very well managed with that number, if there be not much out-cartage; and they may be easily worked by one carter and his mate, with a stout lad able to hold and drive, or one of the laborers, when a third plough is required. Supposing, then, the horses to be soiled from old May-day to Michael-

*Original and Corrected Report, p. 584.

† Vol. iii. p. 194.

‡ Sir J. Sinclair, Husbandry of Scotland, p. 125. § Berwickshire Report, p. 406. ¶ West Lothian, p. 178. ‖ Library of Useful Knowledge, Farmer's Series, No. 18. Dumbartonshire Report, p. 251. ** Middleton's Middlesex, p. 97.

††Essay on the Agriculture of the Vale of Forth, by Mr. Carmichael.—Prize Essays of the Highland Society, 1833, vol. iv. p. 24.

mas on grasses worth £6 the acre, with two quarters of oats each, at 24*s.* to be given on working days, and from that time to be allowed each 10 lbs. daily of bruised beans, ground oats, or barley, with 12 lbs. of clover or sainfoin hay, and 20 lbs. of straw or haulm for both chaff and litter; and calculating that quantity of each species of grain to be worth 9*d.*,* hay at 65*s.*, and straw, or haulm, 20*s.* per ton,† on the farm—which may be about the present home value of the best qualities in most places—the cost of feeding and farriery would be:—

One horse Summer soiling	20 weeks, 140 perches, at 9*d.*	5	5	0	
	2 qrs. oats 24*s.*	2	8	0	
					7 13 0
One horse winter-feeding per week.	Corn 10lbs. per day, at 9*d.*	0	5	3	
	Hay 1½ truss, 19½*d*	0	2	5¼	
	Straw 1¼ cwt. 1*s.*	0	1	3	
	32 weeks, - -	0	8	11¼	=14 6 0
	Shoeing and farriery, - -				1 10 0
					£23 9 0

The annual charge of maintaining a single horse being thus ascertained, there remains to be added to the collective expense of the team, the interest of the capital sunk in their purchase, and in that of the implements for their use, including a wagon and carts, with their gear; and allowing these to cost £140, and the horses and harness, one with another, to stand in £26 each, with ten per cent. for repairs and deterioration of value, the whole account will appear thus:

	£.	*s.*	*d.*
Maintenance of 5 horses at £23 9*s.* each, - - - - -	117	5	0
Interest on £270, cost of teams and implements, at 5 per cent. £13 10 0			
Repairs and deterioration of ditto at 10 per cent. - - 27 0 0			
	40	10	0
First carter‡—weekly wages, 31 5 0			
Second do.—annual wages, 10 0 0			
Second do.—board at 6*s.* per week, - - 15 12 0			
	56	17	0
Stable and contingent expenses, - -	10	0	0
	£224	12	0

Labor.

The *annual labor* of a man and a pair of horses, with the necessary implements, will therefore cost £89 16*s.* 2*d.*, or, throwing fractional parts aside, 6*s.* for every working day; but, as many days occur on which they are only half, or not at all employed, more than five days in each week, or 260 in the year, cannot be calculated on, which gives nearly 7*s.* per day, as the actual expense; and presuming them to be adequate to the cultivation of 40 to 60 acres, the tillage in each case will cost—

89£. 16*s.* 2*d.* / say 90£. — 40 acres = 2£. 5*s.* 0*d.*; 50 " = 1 16 0; 60 " = 1 10 0 — per acre.

It will perhaps be objected, that as all the other work of a farm, such as statute-labor, carriage of materials for drains, repairs, &c. is also performed by the same teams, the entire charge should not fall upon the tillage; but, as all those operations are incidental to the cultivation of the land, they may, in fact, be regarded as forming part of it, and any separate estimate would not alter the total amount of the annual expense. Whenever it may be material to ascertain the actual cost of any specific work, the time it occupies being known, the calculation can be readily made according to the above valuation; and farmers would find it useful in enabling them to form a correct judgment on many points of great importance were they to make out an account of the actual expense of their teams, and to charge each day's work against the particular object on which it was employed. But in calculating the cost of the tillage of any one field, the mere charge of each day's ordinary work would be a fallacious guide; for that would only show the labor actually expended on the land without any share of the incidental labor of the whole farm: in such estimates, therefore, the annual expense of the team must be divided by the number of days consumed in tillage only; and supposing that to amount to but two-thirds of the entire labor, it would follow that, when each day's labor throughout the whole year costs 7*s.* the charge for a day's ploughing should be 10*s.* 6*d.*

The *daily labor of a team* must necessarily be regulated by the manner in which it is employed, as well as by its strength. In some of the southern and midland counties, the carters who generally sleep in the house, rise at four in the morning, feed, clean, and harness the horses, get breakfast, and are ready to go a-field at six-o'clock, or after seven in the winter, when they work till two, thus making at the utmost a yoking of eight hours. When the horses return to the stable they have a little hay given to them while their attendants have dinner, by which time it is past four, when one of the men curries, feeds, and litters them down, while the other fetches their provender, either green or dry, and usually finishes his evening by a lounge at the smithy, either to get the ploughshare pointed, or to have some talk with his fellows, until the hour of eight leads him home to supper. Throughout the north, however, the usual hours of work are, in the spring and summer, from six to eleven, and from two to six, or seven, allowing the intermediate three hours for rest and feeding: in winter, at the utmost from seven to four, with one or two hours' rest at mid-day; though, at that season, it is a better practice to finish the day's work, without returning to the stable, at one bout of seven hours, during which the horses may get a feed from their nose-bags, while the ploughman takes his lunch, which he carries with him to the field. The common calculation is, that, taking the year round, an acre of land is thus ploughed in a day; and, generally speaking, this may not be wide of the fact: but the exact

* See note, p. 145, but those are assumed as the market prices; here they should be lower.

† In point of fact, no charge should be made for straw when it is not allowed to be sold; for, if not eaten, it must be consumed as litter; and when charged to cattle, it must be again allowed for, in account, as dung.

‡ The estimate of wages and board for each of the men is taken between the highest and lowest rate; for out-door and in-door servants were both kept either in, or out of the house—the amount, at a medium rate, would be nearly similar.

quantity, and the requisite number of horses must depend upon the nature and condition of the soil; the season; the way in which the work is performed; and the sort of cattle employed. Notwithstanding the broad assertion 'that two-horse ploughs are fully adequate to the tillage of any soil, however heavy,'* it is certain that there is land in the Weald of Kent, and the adjacent similar districts, so exceedingly stiff and wet, that four powerful horses, or six strong Sussex oxen, are sometimes brought to a stand still in breaking it up:† the mode of ploughing, too, sometimes requires that the horses should go at length, in which case three are hardly more efficient than a pair abreast; and it is well known to practical men that, even with apparently proportionate additional strength, an acre of stubborn clay cannot be broken up in the same time as a ley of friable loam. Much ingenuity has been exercised to facilitate the execution of field-labor; various forms of the plough have been constructed to operate with less resistance, and the work has been executed by the application of less power. This is, no doubt, a great improvement, when the purpose can be equally well attained. It is pleasant to see a ploughman conduct a pair of well-trained horses to the field, and in a masterly manner perform the work which formerly required the aid of an awkward ploughboy and a number of unwieldy animals; and when the implements are good, and the ploughman intelligent and dexterous, this, no doubt, may be done. But it has been well observed, by a writer of great experience,‡ that 'fashion overrules judgment, and too ill-appointed animals are often expected to perform that which is sufficient for the most powerful; the surface is slightly scratched, attention to preserve the depth of the soil is disregarded, and the progress of cultivation and fertility retarded.' Adequate force should be employed to stir the ground to such a depth as a healthy vegetation requires; the breadth as well as the depth of the furrow, too, and the pace at which it is turned, govern the quantity that can be ploughed in a given time. The ground gone over in ploughing an acre is, with a broad furrow-slice, about eleven miles, or with one of eight inches, twelve miles and three furlongs, exclusive of turnings: and it has been ascertained, that a team, walking at the different rates of one and a half and two miles an hour, will plough the following quantity of a medium soil, to the depth of five inches, nine hours:—

Inches.			A.	R.	P.
Breadth of furrow 8	at 1½	miles per hour	1	0	0
9	"	"	1	0	20
8	2	"	1	1	10
9	"	"	1	2	0

The difference in the quantity ploughed in these instances clearly demonstrates the value of action in the horses; but it must at the same time be observed, that the distance travelled at the slow pace is only twelve, while at the quicker rate it is sixteen miles; and that a ploughman must possess more than ordinary strength and dexterity to go through that degree of labor, and perform it well; for although he may rest himself occasionally by means of the plough tail, yet that is always at the expense both of the cattle, and of the regularity of the work. Mr. Parkinson mentions an instance of an Irish ploughman who, in a medium soil, and with a nine-inch furrow, turned over at the second ploughing, with a pair of horses of the heavy dray kind, 1 acre and 20 perches (Irish measure) in six hours and ten minutes, which is at the rate of nearly 2 acres 2 roods in eight hours; the horses must therefore have walked during that time at the rate of three miles an hour; but he admits that no horses, with any keep, could have maintained such daily labor for a continuance.* On the whole, therefore, it may be concluded, that an acre and a half is the utmost that can be ploughed with a common furrow, on any soil; and that on an average, from an acre, to an acre and a quarter, in summer, and three-fourths of an acre in winter, may be considered as the day's work of a team; the strength being in proportion to the land.

* Quarterly Journal of Agriculture, No. XI. p. 714.

† Kent Report, 2d edit. p. 20. Surrey Report, (Stevenson's,) p. 195. In some of the red clay land, in the Newbury district of Berkshire, *five* horses find hard work in turning up three-quarters of an acre in a day. Berks. Report, p. 119.

‡ John Naismith, Esq., part iv. No. i. of the second vol. of the Appendix to the General Report of Scotland.

* Parkinson on Live Stock, vol. ii. p. 132.

MR. CURWEN'S DIARY OF HIS HARVEST LABORS, IN CUMBERLAND.

[It is not with the expectation that our readers can derive instruction for practice from the following diary, that it has been selected for their perusal. Harvest in Virginia is so widely different in every respect from harvest in the north of England, that scarcely any thing usual or proper in the one, would be fit for imitation in the other. The climate and unusual degree of moisture—the time of year—the reaping (or "shearing") implements—the kind of labor, and the manner of its application—all are different in that cold and dripping region, from ours: and with our views, it seems a wonder, under such circumstances as are narrated, that all the wheat in the country was not lost, instead of being generally well saved. But this very difference of our circumstances from those here described, will lend some interest to the statements—and there is another thing that will serve to increase the interest to most readers, and it is this particular to which we especially invite attention. The pleasure which will be found in the perusal of this diary is almost entirely owing to the minuteness of the details. And if even a slight interest is thus produced, concerning a locality and circumstances altogether strange to us, much greater would it be, if as minute a statement was presented of a well conducted harvest in Virginia. And such a diary, would not only give pleasure, but instruction, in the best and most effective form.

It is scarcely necessary to state that Mr. Curwen was one of the most intelligent and distinguished farmers of England. This diary is extracted from his report to the Workington Agricultural Society of which he was the President.]

"*Park wheat—22 acres.*] On the 28th of August, this crop was begun to be cut. It was less injured than I expected from the situation of the

ground, which I attribute to its being drilled at twelve inches distance. Some parts were laid, but generally it was upstanding. Considering its low situation, it must be always subject to risk. If this had not been sown so particularly thin, the crop would have been entirely spoilt. There were 1135 stooks, or 51 upon an acre. The clover plant very good, and extremely clean. This crop was taken off beyond all expectations, and will be the first wheat in the neighborhood. The necessity of being most particularly attentive to cleaning and picking small potatoes, is apparent here; for there are still a great deal more growing than there ought to have been. They not only offend the eye, but injure the crop.

"*Gilderskill*—30 *acres.*] One part (about five acres) was very much laid, and had a great number of black heads. I did not observe, however, any appearance of mildew. The wheat had been much injured by the frost. Sheep were put upon it for a few days; and where they had fed, it was much the best. It had been too proud before the sheep were turned upon it, and they did not like it. The season, however, became so wet, that they could not have been kept long upon it. The highest part of the field was extremely good. There were 1105 stooks, or 36 per acre. This wheat was so ripe, that had there come any wind before it was cut, there must have been a great loss from the shake.

"*Moor Close*—42 *acres.*] The two fields which were quite a new creation, produced a very good crop. Some few acres were laid and injured; but generally it was most productive, and had in one 802 stooks, and in the other 1058; and some parts of it turned out as fine grain as I ever beheld. Had the season been favorable, this would have been a most surprising crop. Those who envy farmers their success, let them look to this season, and see the ruin which has threatened their whole produce; and unless the latter part of the season becomes favorable, I do not know how farmers upon wet ground will be able to support their stock. The turnips and cabbages have made no progress for the last three weeks, and it can scarce be hoped they will gain the weight of half a tolerable crop.

"The advantage of being near a town is very great. I was able to muster, without giving extra wages, 220 persons. Women have 2s. per day, and work between nine and ten hours—men 2s. 6*d*. In difficult seasons, to be able to cut between 30 and 40 acres a day, greatly lessens the risk, and is an additional reason for having lands near towns under tillage.

"*August* 30*th.*] The incessant rain for five weeks saturated the ground to such a degree, as to put a stop to the growth of clover on wet soils, where it had been late cut. In some parts, the roots appear to have been affected, and the clover seemed to have lost its feeding quality. Plants appear to require the sun to bring them to perfection, as much as the earth does the heat of his beams to promote their growth.

"For one fortnight, the experimental cattle all lost weight, and the milch cows gave less milk. I was compelled to suspend soiling, and turn my cows upon the aftermath, to give the clover time to get a growth. What was first cut had made such progress before the wet came on, that it was not materially affected, and cut uncommonly well. I attribute this to the plants covering the ground, and guarding the roots. The cover also kept it warm. The same observation is applicable to the pastures that were earliest cut. Turnips and other roots that were very forward, have suffered least. This unexampled season has been attended with difficulties I never experienced; and, unless the month of September turns out favorably, the distress will be general. The wet has arrested the growth of the turnip. No crops come up better, or appear more promising. The rain seems to have suspended the vegetative power of the earth, and checked the growth of plants of all kinds. Nothing could be more discouraging than this day. I have never known the ground wetter, at any season. The cabbages were equally stopped in their growth.

"I was not previously aware of the full extent of fortitude and patience required to make a good farmer. Philosophy is not an acquirement of learning alone: it is one thing to argue well, and another to adopt the maxims of wisdom as the rule of practice. In the midst of one of the violent showers so common in this climate, I was glad, with a friend who was along with me, to take shelter in the house of a small farmer. Presently after our arrival, the master and his servants were likewise driven in. The children received the parent with delight, and he returned their caresses. The felicity their endearments inspired, seemed at once to restore the calm and tranquillity of his mind. Domestic sunshine disarmed the merciless peltings of the storm. Its injuries seemed no longer felt or regarded. Struck with surprise I was resolved to prove whether this was the effects of indifference or real magnanimity. I began, with some asperity, to rail at the weather, which was answered by the good man with great composure, 'that God never sent a crop without a season to get it in." And having made this reply, which comprised all his knowledge and belief on the subject, continued his merriment and innocent pastime with the children. I know not what effect the recital may have on others; but on my friend and self it acted as an electric shock. We could neither refrain our admiration: and the train of ideas that flowed from it led us to this conclusion, that practical wisdom is the offspring of virtue, and the twin sister of happiness.

"A twelve acre field of wheat at Moor Close, which had been fed with sheep, cut uncommonly well, and was, in general, very heavy, and an excellent grain. There were 540 stooks, or 45 per acre.

"The last of August, and the first two days in September, were a great blessing to the country. From the appearance of change on Saturday the 2d, I persevered cutting till it was nearly dark, and thereby saved a part of a field, very ripe, and so exposed, that the high wind which came on in the night would have greatly injured it. I own I am often surprised with the confidence I see placed in a climate so uncertain as ours. For myself, I disclaim all trust which can be avoided by exertion.

"*September* 4*th.*] Cut one field of two acres from fallow, which had 105 stooks—the wheat uncommonly good. Much rain in the night, with partial showers during the day. I discovered that in many parts of the spring wheat there were a great number of black heads. These are more

apparent as the spring wheat ripens. The few fine days have already made a sensible difference in the appearance of the turnips. Where the stitches have been opened by the plough, I have no doubt it will be proved that the earth has recovered part of its natural heat.

"*September 5th.*] The weather relapsed. The warm gleams of sun were very injurious in making the corn heat and sprout. This was a heart-breaking day to the farmer.

"*September 6th.*] Being wet in the morning, the afternoon broke out fine, and did infinite benefit to the grain which was cut. Lodged corn will now become every day worse. The first loss will be found the least. It is expedient to cut what is in that state, and take the chance, by exposing it, that a part may thereby be saved. Cut above 500 stooks.

"*September 7th.*] In the night there had been violent thunder showers. An unpromising morning. It cleared up at ten o'clock; and I began cutting spring wheat, a very moderate crop, something better than the last year. I doubt much whether I shall ever attempt sowing it again; certainly not the kind common in this country. Early in the afternoon, a very heavy shower, which put a stop to any further cutting. The wet and heat is most injurious both to the lodged and the cut grain. Seeing the probability of a change, I was fortunate in getting all I had got cut both this and the former day hooded. In such a season, the farmer has the choice of difficulties: to wait is destruction—to proceed is injurious. Prices will remunerate the farmer; but what will be the situation of the laborer and lower orders, who make no provision for a season of difficulty? The present prospect is as gloomy as possible.

"*September 8th.*] A moist day, and not a breath of air to dry the ground. Cut two fields of wheat, with four acres of indifferent oats. The warmth of the weather, together with moisture, is most destructive to grain. Since the ploughing between the stitches, the turnips have made some progress, and recovered their color. Led and thrashed the winter barley, which, in the moist state of the straw, was attended with difficulty. The situation where it grew was very low, and unfavorable for barley: a part had been lodged, and suffered. Harvest demands redoubled exertion: an error or omission in this cannot be retrieved. Few can hit the happy medium, uniting energy with sound discretion. To accelerate too much in carrying grain, is subject to loss: to omit a tolerably favorable opportunity may be equally so. In such a season as this, the farmer has only a choice of difficulties. Anxiety to get forward is the rock, I feel, I have to guard against. After endless plague, vexation and loss, I got my hay out of pike into stack. It had suffered less than I expected, though much more than I wished, and has proved a very light crop. Fortunately, disappointments are soon forgotten; and however adverse seasons may be, upon every failure hope still renews her golden promises. For four days I have anxiously expected to be able to secure a part of my crop, having upwards of 6000 stooks cut.

"*September 9th.*] The morning was dubious, but soon cleared up, and became a fine harvest day. Began to carry rather too soon. The height to which the stacks are elevated, gives them a great advantage. Employed 150 shearers. A few acres of the wheat in Mealrigs, was much disfigured by docks. I cannot account for it in any other way, than by supposing the seed was brought in sludge got from a tarn, into which the drainage of the town runs: this was used as a top dressing, when this part of the field was under clover. I stacked 2000 stooks. In the state of the weather, this must be considered as particularly fortunate.

"*Sunday, September 10th.*] In the precarious state of the weather, that which would, in all other cases, be inexcusable, becomes an imperious duty. I hesitated not, this day, to employ every hand to secure the grain which was ready for carrying. The preservation of life is a duty strictly enjoined us. That cannot be deemed a profanation of the Sabbath, which proceeds upon the principle of preserving what is necessary for the existence of a number of our fellow creatures. Were it a question of individual gain, it ought not to be done. In seasons when the weather is generally good, I should not recommend it. But after fifty days, without there having been twenty-four hours fair, the omission might hazard an immense loss to the public; and no argument can be fairly deduced from this, to justify any neglect of religious duties. Led 1500 stooks. At twelve o'clock it came on again to rain, and superseded all further proceedings. I was glad to see the general exertion that was made by every farmer around to save his crop. The afternoon again cleared up; and in common and ordinary seasons, one might reasonably hope a fine day would succeed. The wind has never been steady to any point for fourteen hours; and much of the rain has had the appearance of thunder storms.

"*September 11th.*] The return of sunshine, and a fine drying wind, reanimated the farmer's hopes. All was gratitude. Past miseries vanished. The joys of a good harvest were anticipated. The difference between the state of the grain, at seven o'clock in the morning, and at six in the evening, was scarce to be described. Most melancholy was the appearance when the reapers began. The wheat was not in a state to bind till the afternoon. Two hundred people were employed in the field between the Schoose and the town. All was gaiety—so soon are sorrows forgotten. The impatience of the day before had led to the attempting too much; and a part of the stacks was obliged to be opened to prevent losses. The wind afforded an opportunity of thrashing. Ninety Winchesters, or thirty Cumberland bushels, were dressed in the afternoon—the grain very good.

"Commence sowing the newly enclosed common to-morrow, which should have been done three weeks sooner, if the season would have permitted. I do not know I ever felt more real pleasure than I experienced this day. The melancholy presages that the weather had inspired, and the apprehensions resulting from the fear of scarcity, gave way to the more pleasing hopes of abundance. Good humor and cheerfulness animated the numerous group. To save and secure the crop seemed the prevailing sentiment of every breast. I passed eleven hours a spectator of this scene. If I had wanted individual causes of gratitude and thankfulness, it would have been difficult to have avoided sharing the content and happiness that were so widely diffused.

"*September 12th.*] A continuation of fine wea-

ther, with a drying north wind. Led 1500 stooks, and thrashed three hundred Winchesters of the Park wheat, which turns out admirable. Began sowing wheat. Thirteen pair of harrows upon the new enclosure. Employed a hundred and sixty persons shearing. The ground still as wet as during any part of the winter. An evident improvement in the turnips. The country resounds with the cheerful voices of the harvesters. Every quarter presents a scene of activity and bustle. One very principal object in detailing the transactions of harvest is to show to those who have not the experience, what are the difficulties, what the anxieties, which farmers must encounter. Though honey may be extracted from farming, it is very often gathered off the point of the thorn. Every kindness and indulgence is due to the industrious farmer.

"*September* 13*th.*] A tolerable day; but gave early appearance of change. Cut out a 16 acre field, adjoining Gilderskill, which had 1021 stooks, on clover lea. It was but a moderate crop. The Schoose field, 60 acres, had 4340 stooks, or 72 per acre, after potatoes. My friend, Mr. Ponsonby, was solicitous the grain should stand till the Meeting, as the most convincing proof that could be given of the excellence of the drill husbandry. Stacked eight hundred stooks. Reduced my shearers to eighty, as some part of the spring wheat is scarce fit to cut. Employed forty boys weeding wild mustard from the cole. The difficulty of fixing the attention of children is great. Force cannot be applied, as there is no delegating such a power. I hit upon this method to expedite the work. Four leaders were selected; and each had ten boys under him, who were chosen alternately by the captains, and a shilling was to be given in the morning and afternoon, as a reward for that company which performed the most in the best manner. Work at once changed its nature. Emulation fired each youthful mind; and that which, the day before, was an irksome labor, became a work of inclination. It was surprising what was done. As the best deserving, where all were meritorious, could not be decided, it ended in each company receiving a reward, over and above their wages.

"The farmer, whose servants have his interest at heart, possesses a real treasure. Hours ought not to be regarded in seasons of difficulty. A crop may often be saved by continuing work a few hours beyond the regular fixed times. And this is no more than justice; for, how often does the weather interrupt the regular portion of labor? An honest man keeps this in mind, and amply compensates for it in harvest and seed time.

"*September* 14*th.*] A wet day. The advantage of being situated near to a town is very considerable. When the shearers cannot work, the farmer incurs no expense. In places distant from towns, where the harvest people are hired into the house, it falls very heavy, and adds much to the expense and difficulty of a bad season. Finished sowing 72 acres of wheat. Could the drill have been employed, it would have saved one pound per acre.

"*September* 15*th.*] A fine morning but no wind. The ground has, hitherto, dried very little. The distress of farmers cannot fail of being great, from the prodigious failure of the turnip crop. I do not flatter myself with seeing mine average ten tons per acre. Had the season proved tolerable, they should have reached near forty, from the condition of the ground, and the pains that have been taken with it. It is greatly to be feared the potatoes will, in many places, likewise be a very defective crop. Combining these two things, I look with very considerable anxiety of mind to carrying on my dairy, which is now become a very essential source of support to numbers. In order to make every possible provision for supplying the defect, I have ordered thirty tons of oil-cake. This, when ground and boiled with chaff and cut straw, must be the main support of my milch cows. This was the warmest day, with the most powerful sun, we have had for many weeks. The ground wants heating to produce vegetation. In no year within memory, was there so poor an aftermath, which is entirely owing to the ground being so cooled by the continual rains. Stacked eight hundred stooks from Mealrigs. Employed six pair of oxen, ploughing single, which, though difficult at first, will soon be accomplished.

"*September* 16*th.*] A great fall of rain during the night: Cleared up at ten. Employed a hundred and twenty shearers in the afternoon. It takes five women, on an average, to cut an acre per day: Four good shearers will do it. Drilled grain is much easier to cut than broadcast. The hopes of any continuance of fine weather grow daily less. I now lament I had not begun to house earlier the day before. If the night be fair, I shall feel myself compelled to employ all my strength to-morrow.

"*Sunday, September* 17*th.*] Six o'clock, the morning unpromising. Began at seven to make every exertion, as there was a strong appearance of change. The rain kept off till four, when we had fortunately concluded the carrying 3000 stooks of wheat, which finished the Schoose field. The order, regularity, and decency of those employed, marked the work as one of necessity, not of choice. On such occasions I incur a debt of obligation. Whatever remuneration I feel it proper for me to give, is bestowed as a free gratuity. Those who rescue the crop, have a strong and undeniable claim upon it, in case of necessity. The heat of the earth has advanced some degrees in the last two days.

"*September* 18*th.*] I shall here conclude the details of the harvest, already, I fear, extended too far. I have given a faithful representation of my own feelings, from whence may be calculated what must be those of farmers, who have more at stake than credit. Frequently, their whole means are embarked, and dependent upon their crops. If it has the good fortune to create an interest and consideration for this most respectable body, it answers the purpose I have in view. The exertions of yesterday saved 3000 stooks of wheat. The deluge of rain which has fallen this day, must do most material injury to the grain. With resignation and hope, I still look to a return of good weather, not only to save the crop, but to prepare for that of a succeeding year. It would be distant from my wish to deter any one from the practice of farming, by a recital of its difficulties. Let it be remembered, there is no honor without danger; no pursuit exempt from anxiety and disappointment: These give zest to success. Uninterrupted sunshine, ardently as I now pray for it, would prove equally destructive.

"*September* 19*th.*] The violence and length of

the rain, on Monday, produced the greatest flood that has been known for fifty years. The damage was prodigious. Grain of various kinds was strowed over the beach, from Workington to Harrington; and a great quantity was picked up, and carried off. The break of my wind-mill had not been secured, and it was set to work, and not discovered till it had done considerable damage. The loss was something; the mortification infinitely more, as it prevented its being shown at work during the Meeting.

"*Sunday the 24th.*] Secured above 3000 stooks of grain. The 25th, finished shearing the small quantity of wheat remaining. Led all that had been previously cut. The conclusion of harvest was celebrated by all my work people, at the Schoose. Upwards of three hundred of both sexes spent a few hours in great festivity and good humor; rejoicing that the labors of harvest were concluded, and grateful for the bounteous store which secures abundance to those by the sweat of whose brow it has been produced."

[To this we will add part of the comments of the conductor of the Edinburgh Farmer's Magazine, upon the report and diary—who, it is believed from various indirect proofs furnished by the general work, was that excellent Scottish farmer, Robert Brown, of Markle.]

The next remark which we offer, is with regard to the carrying of corn upon the Sabbath day; a practice not only contrary to the laws of God and man, but also hostile to the welfare of the state, and the truest and best interests of mankind. The President pleads necessity as an excuse for working upon that day; but this excuse cannot be allowed, unless circumstances be such as to demand immediate attention. If a house is on fire, every person knows that prompt exertion must be used to quench the flames, otherwise destruction to the premises would inevitably ensue; therefore, none will find fault with working on the Sabbath, in that case, or in others of like necessity. There is no occasion, however, to argue the point; the dullest capacity being sufficiently able to distinguish betwixt works of necessity and mercy, which may be lawfully performed on the Sabbath, and those which ought to be deferred till another occasion. But, putting the morality of the question aside, we would ask Mr. Curwen, and other advocates for Sabbath days' work, what would become of the great body of the people, not only those who work for their daily bread, but also those regularly engaged in business, were not their bodies strengthened by rest, and opportunity afforded for instructing their minds, on a day hitherto considered, in this country, as set apart for these purposes. The bulk of mankind, even *with* the Sabbath, are ignorant enough; but, *without* it, they would become not much better than the brutal part of the creation, casting off all those restraints which serve to make them good subjects, and good members of society.

We are quite aware that the term of canting may be applied to these remarks; but any thing of that nature will give us small uneasiness. It may be added, that the plea of necessity urged by Mr. Curwen, for carrying corn on the Sabbath, cannot be allowed in our court as a relevant one, as, besides the moral objections already stated against the plea, we must whisper in his ear, that the writer of this article harvested many more acres of corn last year [1809] than mentioned by Mr. Curwen, and with far less strength than kept by him, without spoiling a single sheaf thereof. In a word, if the fixed ordinary days of the week are well employed, there is no occasion for working on the seventh.

HOW TO BUILD WHEAT SHOCKS.

To the Editor of the Farmers' Register.

The different operations required for our wheat harvest, are the most important that most of us have to perform, and in which, bad management is followed by the most certain and heavy losses. Yet there is no branch of farming in which there has been greater difference of operation, on different farms, and at different times on the same farms—and in no other has the introduction and dissemination of improved processes been more slow. The cause of this is to be found in the supposed necessity for every farmer attending closely to his own harvest, and the great inconvenience of any one's leaving his own business, even for a day, to ride 10 miles to see the harvest management of some one more experienced. I now know as to myself, that I was sustaining losses for years together, from ignorance in various particulars, which might have been easily avoided by giving a single day to viewing the operations of some better farmer. One of the things by which I suffered most was the want of knowledge of the proper mode of building "shocks" capable of withstanding the entrance of rains. After having been losing much in labor, and still more in grain, for sundry successive harvests, I was indebted to the late John Minge of Charles city, (one of the best practical farmers in our country,) for such verbal instructions on the subject, as served in a great measure to remove my difficulties, and to prevent the losses caused by bad shocks. As there are still very many who pursue as bad a plan as mine was formerly, and who are too industrious to learn by going to see better management, I will try to point out, for their use, the defects of the one, and the advantages of the other mode of building shocks.

The plan which I formerly adopted in conformity with the usage of my neighborhood, and which still prevails on many farms, may be described generally as follows: Sheaves were set up on their "buts," as close together as they could be pressed, and with the heads a little inclined to the centre of the intended shock, until a circular foundation was formed, about eight feet in diameter on the ground, and perhaps two feet less across the flat top, formed by the heads of the sheaves. On this body, or foundation, a conical top or roof was built in this manner. Four sheaves were laid flat on the top, their heads meeting and crossing on the centre, and their buts jutting outside of the upper edge of the foundation—the four forming straight lines, and right angles, so as to divide the circular top of the foundation into four equal parts. Four other sheaves were then laid in like manner, but so as to fall on the middles of the vacancies left between the first. As the tops of all crossed the central point, of course their repeated doubling there produced a rapidly rising peak. Other sheaves were then laid so as to cover all the openings between the first eight, and still meeting at the peak, as long as sheaves would stand as placed, and so as to shape the roof, and

its point in the best manner. Some of the most careful placed over the peak a cap-sheaf; but this additional trouble added very little security to a shock not properly roofed. A cover like this cannot prevent a heavy rain, nor even a slow soaking rain, from penetrating, although moderate rains may be partly thrown off, by the inclined portion of the sheaves, and the water which penetrates may dry before it sprouts the wheat. In the latter circumstance consists the safety of bad shocks—for they let the water out, by evaporation, as readily as they let it come in, by the tendency of its weight: and in our hot and sunny climate, wheat will not soon sprout, that is exposed to the access of sun and air, as well as to rain. Every wetting however, is injurious, though not continued long enough to start the sprout.

The principle upon which a shock is properly covered is altogether different from that of the foregoing plan, and is similar to that of covering a roof with shingles. The foundation is begun with three or four sheaves set up so as to form a little cone—that is, the buts on the ground set out so as to make a base broad enough for them to stand when the heads are brought together, (as they should be) to a point. Other sheaves are set up in the breaks of the first, placed firmly on the earth, and the heads inclined to the central point. This brings the base to a small circle, and the heap to a conical form. The builder (and there should be only one to a shock, to secure good and equal work,) now continues to add to this, by placing other sheaves on the ground and against the breaks between the preceding course, and thus going round the circular heap, until the foundation is large enough. The but of every sheaf should be well pressed to the earth, when placed, and its top pressed to the central point, with increased force, as the size of the heap will bear the pressure without danger of its being moved. When the foundation is finished, instead of being flat topped, it rises to a central point, and its whole profile is somewhat in the shape of the old fashioned Dutch or "hipped" roofs of houses—the sides of the sheaves forming the lower slopes, and the heads, the upper.

For covering the shocks the smaller sheaves should be reserved, and none very large there admitted. The first course of the cover is made by striking some of the stubble ends of the straw upon the band of the outer sheaves of the foundation, so that some straws go within the band, and thus hold the sheaf where placed. The circle is completed by sheaves so placed, the buts close to each other, and the heads leaning inwards towards the middle of the shock. A second course is carried around in like manner rising on the first, and resting on and within the bands of its sheaves. The point is now nearly reached and formed; and what it wants, is given by using the smallest sheaves. The heads of the last only are exposed, and they will be generally not more than four or five sheaves: and these are protected and secured in their places, by a cap, formed of a large sheaf turned with the but upward, and the heads so spread open as to hang over and all around the sides of the peak.

If I have succeeded in making my description intelligible, it will be seen that such a shock is completely *shingled* with sheaves, and that the straw of each course overhangs and protects the heads of all below. Of course it is not meant to be understood that such a covering is perfect: but if rain gets in at any opening, the course of sheaves below will tend to throw it out at the eaves. Indeed, if the body of the shock has been well put up, and retains its position tolerably well, it will require unusual bad weather to produce any noticeable damage.

Now, Mr. Editor, it may be said that I have used many words about a small matter, and to explain what every good manager knows as well, or better than the writer. Admitting all this, my labor may be useful to very many other persons—and every one who may thereby learn to save even one or two shocks of wheat in the approaching harvest, which would otherwise be lost, will be at least a gainer of as much as the cost of his year's subscription to the Farmers' Register.

May 22d, 1834. Q.

For the Farmers' Register.

The following remarks for the Register were written about twelve months ago, but being mislaid until after harvest, it was then thought more timely to publish them just before that season.

HARVEST MANAGEMENT.

The communication under this head in the first No. of the Farmers' Register, contains too much interesting information, not to have attracted general attention; but while it contains many useful details, which are at once recognized as sound and sensible by every practical farmer, your respectable correspondent, is laboring under one *important error*; and as it is an error generally prevalent in lower Virginia, as well as other districts, and I believe extensively mischievous; I feel myself called upon by the interest of our common vocation, to give the full benefit of a corrective, tested by several years experience, to your correspondent, as well as all the other readers of the Register. The error to which I allude, is the custom, defended in "Harvest Management," of giving ardent spirits to our laborers.

This practice is sustainable upon no grounds, more defensible than mere custom. The argument once used, that ardent spirits imparted strength, has been laid aside with other vulgar errors. Medical science has now established as an axiom, that preternatural excitements are followed by proportional degrees of debility, and that the system in a state of collapse, is more liable to diseases. Of eighty, the whole number of the medical faculty of Boston, seventy-five have concurred in the opinion, that the use of ardent spirits is not only unnecessary but injurious, and I believe very nearly, if not an equal proportion of the medical faculty of other cities who have been consulted, have come to the same conclusion. In short, wherever impartial and enlightened investigation has been directed to the subject, in the course of the great reformation, now happily pervading almost every part of our country; the result has been the exposure of the absurdity of the once received opinions on this head, attributing the most opposite and contradictory effects to the same bewitching cause.

To the lights of science, have been lately added the practical discoveries upon this subject, of the American Temperance Societies, embodying in their reports a mass of evidence and facts, which

carry conviction, I believe, I may safely say, to ninety-nine hundredths of mankind who give them a fair examination, that the use of ardent spirits is unnecessary, injurious, and demoralizing to all classes of men.

My own experience and observations have brought me irresistibly to the same conclusion. For upwards of twenty years preceding the last four, I used from sixty to eighty gallons of spirits in harvest yearly. I then rarely got through the season without some accidents of a more or less serious character. I had several cases of wounds, from which the sufferers were long recovering—many cases of spasm, from drinking cold water after previous partial intoxication; and almost always more or less disease immediately after harvest. It is true, the period was marked by more noise and boisterous mirth, but it was attended with more broils and irregularities, often leading to the necessity of resorting to punishment. During the prevalence of this pernicious custom on my estate, it required from five to six days after harvest, for the laborers to recover from what I then thought, was the necessary effect of the excessive labors of the season, but which subsequent experience has proven, was the weakness and debility consequent upon the unusual excitement of ten days or a fortnight's use of ardent spirits; thus proving to demonstration, that the cheerfulness purchased by alcohol, must be paid for in bodily strength; to say nothing of the punishment often made necessary by its intoxicating effects.

Since I have discontinued the use of ardent spirits in harvest, mark how the scene has been changed. I have saved my grain in better time and in better style, than I ever did before—I have less sickness—fewer accidents—I have no broils or irregularities—my people are as fresh, and able to perform as good a day's work the next after harvest, as any day in the year; and what is still more interesting, (under the system of measures, of which abstinence from the use of spirits in harvest is an indispensible part) nine-tenths of my laborers have become faithful members of the temperance reformation; and this state of things has been brought about by their own consent, without the use of any other means than kindness and persuasion; and furthermore, I verily believe, the following recipe will prove infallible in producing the same effects wherever it is fairly tried:

Let each master take to himself as much self denial and christian resolution, as to enable him to join the temperance reformation; and then condescend to explain its advantages to his own people. The fullest success will surely follow; for there is no yeomanry on earth more docile to moral instruction, than the negroes of Virginia, if their masters will become their teachers.

Total abstinence from ardent spirits, I consider of so much more importance in my "harvest management," than any thing else, that it will seem like an inversion of the proper order of things to advert to other particulars; but, it may not be amiss to mention here, that I have substituted for the spirit formerly used, an equal measure of molasses, which being itself a nutritious article of diet, as well as an ingredient in a cooling and pleasant beverage, is used by my people in the one way or the other, at their discretion. They are now loud and almost unanimous in their preference of it, to their former allowance of whiskey.

I hardly need add, that since so large a portion of my slaves have given up the use of spirits, I have remarked the most striking improvement in their moral characters.

ONE OF YOUR CONSTANT READERS.

TO PREVENT HORSES BEING GALLED BY THE BACK-BAND.

To the Editor of the Farmers' Register.

Powhatan Hill, 25th April, 1834.

I am reminded by the season of planting corn, to make the readers of the "Register" acquainted with a very simple and efficacious contrivance, to save our plough horses from galled backs. I have used the saddle which I am about to describe, for the last two years, a pattern having been made for me by a gentleman from Botetourt county. Since then, I have never had a mule's back cut by the back-band. My neighbors are adopting the expedient, and concur with me in recommending it highly. The sole objection is, that it may cause the slovenly practice of using a grape vine or a rope, in place of a proper back-band, as neither can injure a horse's back with this saddle under it.

The saddle is made of two pieces of oak about eight inches in length and breadth, and with the corners "rounded off"—thick enough to be substantial. The inner side is made convex to suit the horse's back, on each side of the back bone, where they rest. The two pieces are connected by two straps of leather, at each extremity of which are cross straps or loops, through which the back-band is inserted, and which lies over and presses upon the wooden sides of the saddle.

The back-band ought not to touch the back, so that the pieces must not be more than four inches apart. It is very light: oak is better than pine, only because it holds the tacks more securely by which the straps are fastened.

This kind of saddle may be in common use in many parts of Virginia, but I never saw it before I used it on my own farm. I dare say it is new to many of your readers—and my object will be accomplished if only a few poor mules shall be indebted to it for their hides.

ED. F. TAYLOE.

DRAINING.

To the Editor of the Farmers' Register.

Fairfax county, Va. May 20th, 1834.

I promised you some weeks past a communication upon the subject of ditching or draining land. Indisposition on my part, and delay in the surveyor, have operated to retard my purpose. My main drain is something less than 3000 yards in length, having the capacity to receive and discharge the spring and flood water from seven or eight thousand acres of land. 1800 yards were cut through a mill pond which was made by a dam not more than two and a half feet high, which is now put down, by the kindness of the owner. Much of the country around is precipitous and broken; the water from which brought great quantities of sand and mud into my drain, and often made it necessary to clean it out fall and spring. This alone was great labor. Thirty-three years have passed over me since I began the work, and I cannot say that it is perfect. A drain like this must have no angles in it; for they create eddies,

in which all washings will be left, and the work ultimately ruined. This important fact in draining I had to learn by experiment: and upon so long and crooked a stream, (and that a boundary) to straighten all the angles, and make the drain at my own cost and loss, was not exactly pleasant. As a short rule for making drains, let me say that they should be *straight*, and of *full* capacity to contain the water thrown into them, always taking care to begin at the outlet or lowest point. By measure and estimate, sufficiently accurate for all my purposes, I have not less than thirty thousand yards of water and fence ditching, fifteen-sixteenths of which is necessary to the drying and draining of my farm. Not less than one-quarter of all these *must* be scoured and cleaned every year. Like a gambler, I was drawn into this work by imperceptible degrees, and finally played on because I had already lost so much. Separately considered as a matter of profit, I am not prepared to justify such expensive works. Nevertheless they show young farmers that perseverance, with a very limited degree of knowledge and experience, will, in time, surmount what would seem to be insuperable difficulties. Though my land was once remarkable for its great growth of rushes, I believe it would now be difficult to find one. Clover and plaster operate well even upon that land that was covered 50 years by the mill pond. As for covered drains, I have made many, but they were very unsatisfactory: and I would not advise any to make them. No wet land will be benefited by plaster: but the same land made dry, if it had originally good constitution, will give surprising results—a young farmer, by the use of clover and plaster may feel his way into necessary draining: for wherever the land is diseased and unsound, from excess of water, plaster is as useless as sand. I will take this opportunity to say that I am no advocate for deep ploughing, but a decided one for deep stirring. Five or six inches deep for the plough, and then 10 or 12 with the coulter (including that which is broken by the plough,) is the best that I have any knowledge of. No land thus cultivated, will ever wash. It is a great defect in our laws that there is no way for constraining all who are benefited by expensive drains to do their proportion of the work. Nothing can be more just. Bonaparte in his "Code Napoleon," provided for this—but in a community like this, where the politicians rule, and are found at the head and lead of those whose interest it is to keep up a wide spread common, the waste and ultimate desolation of the country is a matter of certainty, and susceptible of mathematical demonstration. Since my agitation of this subject, I have been much amused to hear the little lawyers and political jaybirds chatter about "vested rights," and denounce the high handed aristocracy that would dare to claim the exclusive enjoyment of their own. Poor Virginia!—land of my fathers—land of the virtuous, the brave, and the patriotic—thy destiny may be paralized and arrested for a season—but, like the shorn and maltreated Sampson, time must and will restore thee to thy pristine powers and loveliness—and with "healing on its wings," it is already upon our border. To our highly respected General Assembly I would say, "Ye are the salt of the earth—take care of her rights—to her lap sooner or later you must all go—and for all that I know, must render to *her* some account of your stewardship." The moral and political strength of every country can be measured by the condition of its agriculture.

Contrary to all my calculations, our young wheat promises well—I would rejoice to say the same of our currency: let us believe that "chastisement leadeth to wisdom."

I have planted for 3 years, 7 or 800 locusts each season, and expect to double that number in future. They are planted on ditch banks and turning rows. I would not give up my subscription to the Register for the best horse advertised in the Richmond papers.

Our oat crop is promising, and as I use this as a part of my preparation for fallow, it is not uninteresting; for it gives my horses a good support, and pays well for making the land ready for our wheat crop. Our corn is very unpromising, as it has been cut down twice by frost, and can, at best, do no more than give the produce of crippled plants. My free use of the coulter is all that gives me hope. Though planted early in April, the corn is not visible at many yards distance. I am, nevertheless, giving it the third stirring with the coulter, and the earth is in fine tilth to the depth of ten inches. Should the season become more favorable, all that I can do will be already done for the security of the crop. Our clover is the worst I have seen for 20 years.

I pray your correspondents to excuse my desultory and irregular communication—but trust they will excuse a sick man. I am in debt to them, and offer this, crippled as it is, as "part and parcel" of the currency of the times.

JEREMIAH.

THE QUAIL.

About thirty years ago, this bird was unknown in Canada. It abounds in the Upper Province, but has not yet appeared in the Lower. Its habits appear remarkable, although probably not more so than those of any other wild fowl, when carefully watched. A gentleman, of much patient research in regard to wild animals, who has been a resident in Upper Canada since the quails first made their appearance, happened to have above a hundred at one period alive, and took much pleasure in the evening watching their motions, where they were confined. As it grew dusk, the birds formed themselves into coveys or parties of twelve or fifteen in a circle, the heads out, and tails clustered in the centre. One bird always stood on guard to each party, and remained perfectly stationary for half an hour, when a particular *chuck* being given, another sentinel immediately took his place, and relieved him with as much regularity as any garrison could boast. It became a matter of further curiosity to observe how they would meet the extra duty occasioned by the havoc of the cook. For this also a remedy was found; and the gentleman remarked with admiration, that as their number decreased, the period of watch was extended from a half to a whole hour, in the same form, and with unfailing regularity. [The quail here mentioned is supposed to be the Virginian Partridge, *Perdix virginiana*, the quail of Europe, *Perdix Coturnix*, not being indigenous in any part of America.—EDIT.]—*Quar. Jour. of Agr.*

Diary of the temperature and state of the weather in May, observed at Shellbanks, Prince George county, 37 deg. 14 min. N. Lat.

Fair or sunshine, f—*cloudy,* c—*rain,* r.

MAY.	Thermometer at Sunrise.	Weather.	2 o'clock, P. M.	Weather.	Twilight.	Weather.	Change of weather during the night.
1	47	f		f	62	c	
2	49	f	72	f	63	c	
3	65	f		f	62	c	
4	49	f	72	c	65	c	
5	62	r		c	73	c	
6	50	f		f	72	c	
7	66	c			70	c	
8	62	r	67	f			
9	48	f	72	c	69	c	
10	51	c	67	f	61	c	
11	45	f	79	f	75	c	
12	65	f	75	f	68	c	
13	48	f	61	c	54		
14	42	f					
15	42	f					
16	38	f	61	f	56	f	
17	40	f	75	f	56	f	
18	46	f	85	f	72	f	
19			86	f	75	f	
20	65	f	85	f	76	f	
21	66	c	81	f	74	c	
22	64	c	88	f	79	f	
23	64	f	87	f	78	f	
24	69	f	78	r	73	r	rain all night
25	69	c	79	c	75	c	
26		c	71	r	72	r	
27		c	73	r	70	c	
28	66	c		c	71	c	
29	67	c		r	76	f	
30	67	r	86	f	74	c	
31	66	r		r	70	c	

EXTRACTS FROM PRIVATE CORRESPONDENCE.

CHEAT PRODUCED FROM WHEAT.

Orange county, N. C., April 30th, 1834.

As a slight compensation for the edification I hope to derive from your labors, I take the liberty of mentioning a *fact* which may tend to elucidate a point, on which I observe, you are more than skeptical: I allude to the production of *cheat* from wheat, or, rather, the degeneration of the latter into the former under some circumstances.

Some years ago I had a piece of grass land containing about four acres; about one-half of which was a steep and rich hill side, which was set in red clover and orchard grass; the other half, being the foot of the hill and a moist bottom, was in timothy. The whole had been mowed for hay for several years, twice annually, and was perfectly free from cheat and tolerably clear of other weeds. Between the grasses there was a trench around the hill, along which my spring branch was carried for the purpose of irrigating the timothy. The clovered part requiring new seeding, I planted the upper part of the hill in corn, and in autumn laid it down in wheat. Soon afterwards and about the time the wheat was sprouting, a hasty and hard rain fell which washed a good deal of the soil from the hill side, so as to fill the small ditch at several points and then carried a good deal of earth upon the firm sod of the meadow below, which had recently been mowed. Going into it immediately afterwards for the purpose of having the obstructions in the water trench removed and other damages repaired, I observed that with the earth left on the meadow were many grains of wheat. I had no apprehension of evil consequences at the time, and supposed that those seeds would either perish from want of covering, or the watering of the meadow during winter, or would be wheat and removed at the next year's mowing. They however, vegetated and grew vigorously, and the next spring *every* bunch proved to be *cheat*, while *not one single* head of cheat was discovered among the wheat which remained and grew on the hill where it was sowed and ploughed in—which yielded a good crop, exceeding 20 bushels to the acre, and would have been larger, if it had not received injury, for a short time, from the clover caterpillar. In addition, I have to state that in no part of the meadow was there cheat, except where the earth and seed wheat washed from the hill, were deposited.

To me this phenomenon seems inexplicable, on your hypothesis—but I do not mean to reason on it—leaving that to you and "taking on myself the responsibility" for the fact only. Yet, while I dare not affirm that you are in error, I must say that it seems to me imprudent to deny positively the metamorphosis alleged by so many persons upon observations apparently careful and accurate. It is true that generally, "it hath pleased God to give to every seed *his own* body," and we expect, in the order of nature, when we sow, to reap "after its kind." Nevertheless, we know but little of *substances*, and we know also that nature is constantly working wonders and producing monsters both in the animal and vegetable portions of her productions. *Facts* alone can decide a controversy, and they alone ought therefore to be looked after—and looked to. * * * *

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Sumpter District, S. C. 14th May, 1834.

The subject of marl is a very important one, for the declining states of the Atlantic section. Is it not probable that it is to be found at the same distance from the sea coast, and the primitive formation in the Carolinas? I should suppose so.

It is a great pity a good geological, topographical, mineralogical and geographical survey, could not be had of the States. Why could not there be a class at West Point especially organized for this purpose, whence would issue surveyors of the proper kind? With these the States could join their intelligent youth, who formed into companies, could traverse the country with their instruments, and confer all the benefit which could be required.

The seasons here have been up to this period, very disastrous to the crops of cotton and corn, both of which look miserable from the excessive cold. Corn is selling in Columbia and Camden and the country below, at 87½ to 100 cents per bushel, and will be in some districts worth 125 to 150 cents, before the harvest. In Charleston, the North Carolina corn is to be had at not less than 72. It would be curious to know, what part of these 72 cents go to the grower; and whether a rail road from Roanoke to Fayetteville, and thence to the Peedee, would not put a larger portion into his pocket, and open a much more extensive

market. By growing a large quantity of oats, many planters might buy corn, if sold at a cheap rate, and thus for a few years rest, could restore their land.

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Isle of Wight, Va. 23d May, 1834.

* * * * I now congratulate you on the success and high character, of that publication. And I trust, it will greatly contribute to accelerate the hitherto slow, and almost imperceptible progress of agricultural improvement in Virginia. I am not one of those, however, who imagine that the exhausted fertility of the lands of our state, can be restored in any short period of time. The impoverishment and devastation, which it required more than two centuries to produce, can only be repaired by the successive efforts of several succeeding generations. Nor do I think that improvement in agriculture, necessarily or even essentially depends on any particular system or manner of husbandry. There is only one thing, and that is manuring in some way or other, essential to keep up fertility in land that is cultivated, or to import it in a short time to that which has been exhausted. My own opinion is, that expectations far too sanguine, are indulged by young farmers, as to the facility of improving land; and these are unreasonably encouraged by most of our writers on the subject. And the disappointment of these unreasonable expectations, has perhaps as great a tendency to drive respectable emigrants to the west, as any other cause.

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THE FENCE LAW.

May 24th, 1834.

I have seen several communications in the Farmers' Register on the subject of enclosing. Since, I have spoken to a dozen or more of my acquaintances on the propriety of our legislature, passing a law prohibiting cattle, hogs and sheep, from running at large, and thereby enabling us to do without fences—and every one of whom highly approved of the plan. I have no doubt but that the farming interest would derive more benefit from the passing such a law, than from any other legislative aid it could receive.

I entirely concur with the views of your correspondent on that subject in No. 12 of the Farmers' Register, under the signature of "Anti-fence." Before seeing that communication, I had been thinking myself of getting up a petition and circulating it in this county, praying the passage of such a law as that Anti-fence speaks of. It is my opinion it would receive the signatures of a decided majority of the voters of the county. But as was suggested by Anti-fence, for the sake of uniformity, I think it would be better that a petition come through the Farmers' Register.

ERRONEOUS VIEWS RESPECTING GYPSUM.

For the Farmers' Register.

The last Genesee Farmer, (of May 10th,) contains a communication professing to answer some earlier inquiries respecting gypsum, which may be considered as a curiosity, on account of the number and magnitude of the errors which the writer has contrived to pack into so narrow a space. I will quote the whole piece, and in its regular order, but with my own remarks attached, or interlined, so as to require but few words to serve my purpose.

"Mr. L. Tucker—I think your correspondent "T. S. P. may be assured that gypsum ground "fine, and laid for a long time exposed to the at- "mosphere, will lose much of its fertilizing quality. "Gypsum and limestone, when reduced to powder, "have a strong affinity for carbonic acid." [Neither of them has the slightest affinity for carbonic acid —for limestone is already furnished with as much as its proportion of earth (lime) can combine with —and gypsum is equally saturated with a stronger acid (the sulphuric) which effectually prevents any affinity for, or any effect being produced by carbonic acid.]———"and in as far as they are satu- "rated with this principle, they love their attraction "for it." [This taken alone is true, and would have served to have overturned the preceding part of the same sentence, if the writer had known that one of the substances, limestone, is already and always saturated with this principle, and that the other, gypsum, cannot possibly take up the least particle of it.] "If either be reduced to pow- "der, and spread thin on a plate, and the plate be "set in [over] a fermenting tub of beer, they will "soon be converted to carbonate of lime, or chalk." [That is, would be converted to what the limestone is already, and what neither this, nor any exposure, can possibly make of gypsum. If *quick lime*, instead of limestone and gypsum, was the substance so treated, then such a conversion to carbonate of lime would take place.] "The same "will occur partially if left exposed to atmospheric "air, and in as far as they imbibe this principle, "they lose their fertilizing qualities. Such are my "ideas on this subject, and remain yours, R. M. "W." As such effects cannot take place at all, for the reasons before stated, under any circumstances, it is not worth showing that this inference is as much mistaken, as the theory upon which it rests: nor is there any need of more words to show, that if gypsum loses its power by standing exposed to the air, (which cannot be inferred from its chemical composition or qualities,) we must search for other, and very different causes; than those presented by R. M. W. It is not however my intention to discuss that question, but simply to expose the errors which by being presented so confidently, and in so respectable a journal as the Genesee Farmer, might possibly be imposed on some readers for truth, and knowledge. J. B.

ON THE NECESSITY AND MEANS FOR LEGISLATIVE AID TO AGRICULTURE—NO. 2.

[Continued from page 690, Vol. 1.]

For the Farmers' Register.

According to the intention expressed in a former communication, I proceed to consider the means by which government may promote the improvement of agriculture; and shall direct my observations more particularly to those institutions and plans, which have been least discussed by my fellow laborers in this cause. I shall now consider

Experimental and Pattern Farms.

Among the establishments for the improvement of agricultural science and skill, which have been recommended at different times, a "model or pattern farm" has held a conspicuous place. If I have rightly understood what this establishment was to be, from the words of its advocates, the

model farm was to exhibit, for the example of the agricultural community, the best cultivation and management, the most perfect processes of farming, the use of the most improved utensils and machines, and the trial of experiments on a plan calculated to obtain full and satisfactory results. Now all these subjects are important, and their being attained is highly desirable: but by combining so many on one farm, and under one directing mind, I have no doubt of a failure in almost every part of the scheme. The view to profitable crops and products, (the main object of course on a farm) would prevent any thing like proper and continued attention to courses of experiments: and still there would be enough experiments, and trials of new utensils and machines, and of new plans of tillage, to prevent economy and good management, and the permanency of any regular system, and to cause every year to be marked by disappointment and loss. It does not require much foresight to be satisfied, that a farm on this plan would exhibit any thing but a pattern for others to copy, in all respects; and the contrast between its object and its results—its promise and its performance—would render it a subject for general and unsparing ridicule, and a means of injuring the cause it was intended to sustain.

But putting aside these obstacles to the deriving any farming profit from such an establishment, it may be well doubted whether profit could be made from the crops of any farm, under any possible management, when owned by, and cultivated for the benefit of an agricultural society, or the commonwealth. We know how wasteful is the management, and how unproductive the labors of the agents of the public, and of all joint stock associations: and if a farm of the richest soil, and completely stocked, was managed in like manner, it would most likely yield loss, rather than profit, on the investment of capital. For all these reasons, it would be safest not to calculate on any pecuniary profit being derived from such establishments; but to look for the benefits to be derived, from other sources, and through other means; and these will be found to promise so rich a harvest, that the commonwealth may well afford to pay the cost of making such experiments.

Though an experiment sometimes leads at once to highly profitable results, such cases are very rare; and whatever may be the value of the truths thus established, to the public, the individual who institutes experiments in agriculture, is almost sure to lose by ninety-nine of them in the hundred—and to have his losses increased (on the average) in proportion to the care, accuracy, and patience with which he conducts his experiments. In other words, his losses increase in proportion to the increase of benefit which the public derive (or might derive if they were made known,) from his labors. It is not therefore surprising that there are but few experiments made by individual farmers—and scarcely any conducted in the careful, patient, and expensive manner which is required, to obtain undoubted and valuable results. But this is not the worst. Though not one truth is ascertained by experiment, where one hundred ought to be, and might be, even the few which are discovered remain unknown to the public, and are often forgotten completely, for want of sufficient means of communication: and thus, the labors of the experimenting farmer are almost as sure to be useless to his country, as they are to be hurtful to his own private interest.

In conformity with the views formerly expressed on the subject of the legislative aid needed for the improvement of agriculture in Virginia, I shall not notice those means which others have treated of in the Farmers' Register; and I may pass over the discussion of the importance of experiments, and the course respecting them which agricultural societies ought to pursue, because these parts of the subject have been considered at large, in several pieces in the early numbers of this journal. Taking it for granted, or as proved, that numerous well planned and well conducted experiments on the disputed and doubtful points in agriculture, would be highly beneficial, (if not more beneficial than all other aids,) to the improvement of agricultural science and practice, I proceed to maintain, that to secure this end, the state should establish one or more experimental and pattern farms—not to reap farming profits—but to obtain and disseminate agricultural truths.

If there were a dozen such establishments, there would be no lack of proper subjects for experiments. Indeed it may be truly said that there are more doctrines and facts in doubt, than have yet been clearly settled. But I am not advocating so large a commencement. One such farm would be enough to render great general benefit, and would consume but a small portion of the funds which the legislature ought to appropriate, and I hope *will* appropriate, for the general improvement of agriculture.

But though I consider profitable farming as out of the question on such an establishment as I propose, it does not follow that it may not show what good farming *is*, and serve as the best of models for profitable farms. If it was intended to test the value of the product to be derived from a clover fallow, such as has been described by Mr. Carter and Mr. Selden in the Farmers' Register, and for that purpose all the operations were conducted in the most perfect manner, and the crops of wheat were to be thereby doubled—it would not lessen the value of the result, that no regard had been paid to economy in the general management. If there was exhibited an important result from the preparation of a certain field in a particular mode, or with particular kinds of ploughs and harrows, we could imitate the process, and obtain the like results, without imitating the bad and wasteful management which might have been evident in that, as in every other operation. When engineers, chemists, and scientific mechanics, have made a series of experiments to establish some particular truths, who was ever so silly as to expect profit from such experiments, or to undervalue the results on account of their cost? Governments have often ordered such experiments, and their wisdom in so doing has always been deservedly applauded. Let our government only do the same for agriculture, which has a ten fold greater claim than all other arts, and has a ten fold greater need of such assistance.

It would be worth the employing of the best chemical talent that our country can produce, and the expenditure of $10,000, if so much was required, to carry through a proper series of experiments on the preparation, preservation, and use of barn-yard and stable manure. All sorts of contradictory opinions are held and acted upon on this

subject, although volumes on volumes have been written, and a century consumed in the discussion, without having decided any thing. Perhaps none of these opinions and practices are right—and certainly the greater part must be wrong—and the manure destroyed and wasted by our ignorance in Virginia every year, would support an experimental farm in every county in the state, and every other public institution that has been ever thought of for agricultural improvement. There never will be much light thrown on the mysterious subject of the fermentation of manures, until it is made a matter of the most attentive investigation by scientific and practical chemists—and even if any one individual farmer could be found who was qualified for the investigation, there is none who could submit to the long continued attention and labor, and the very heavy expenses, which would be required for the purpose.

These illustrations are merely brought forward as examples of what an experimental farm could do, and not as the objects which it would be most advisable to begin upon. Every one who will think on the subject will discover, in abundance, proper and profitable work (profitable for the general interests I mean,) to employ all the labor and money that may be appropriated for such purpose. If I induce any to *think*, it is enough: it is not my object, and is altogether needless, to state what will occur to every mind that is directed to the subject. R. N.

MONTHLY COMMERCIAL REPORT.

To the Editor of the Farmers' Register.

Sir—Since my last communication there has been scarcely any change in the situation of commercial affairs. A state of torpor prevails in all the large cities north of Virginia. The spirit of enterprise, which had given activity to commerce and manufactures, continues paralyzed; the industry which was engaged in other than agricultural pursuits, finds no occupation, and not one of the many avocations which employed the capital and labor of our northern brethren, retains its former activity. Bankruptcies have ceased, because few new engagements were made after credit received its shock. This state of inactivity does not prevail so sensibly in the Southern States, whose commerce, instead of being ramified like that of our large cities, throughout every part of the world, is chiefly confined to supplying raw materials to the manufacturers of other countries. Those countries will resort to us, as we do to China, and carry on the trade of which we debar ourselves—a much larger portion of our commerce is therefore conducted on foreign account and with foreign capital than has been in former years.

The prices of our produce have not varied materially during the month. Very fine tobacco, of which the crop contains a smaller proportion than usual, sells at $7 to 11—good 5½ to 6½—inferior and middling 3 to 5. The quantity inspected is less than any former year.

As usual at this season, there is no wheat in market, and most of the mills are idle. Offers are made of early deliveries of the growing crop at one dollar per bushel, or a fraction higher. Flour is worth about $4 50, except that made at the City Mills, of high repute, and which is exported almost entirely to South America. Our farmers may be enabled, in consequence of the immense establishments which will be in full operation this summer, to obtain a higher price for their wheat than can be afforded by the northern millers, who have heretofore procured a portion of their supplies from Virginia.

The price of cotton (12 to 13 cents) has scarcely varied during the month, and has been higher in our markets than in those south of us, where all commercial operations are now greatly embarrassed by the difficulty of making negotiations. Bills on New York, which command a premium in Virginia, are at a discount in the southern cities, and the requiste amount cannot be negotiated unless at a sacrifice to brokers. X.

P. S. Can you not induce some of your intelligent agricultural friends in different parts of the country, to give you a monthly report of the growing crops? From the 12th to the 16th of this month there were severe frosts—most unusual in our climate. It would be interesting to learn what injury was done. The Hessian Fly is said to have committed extensive ravages on the wheat crop—this is another subject of interest. X.

May 28th, 1834.

[Reports of seasons and crops have been already asked for, with very little success. The facts alluded to by X. are enough to show the want of such information. The effects of the frosts of the nights before and after the 16th, were not only unusually severe, but operated very unequally. No considerable damage however, it is believed, was sustained by any field crops—though the first alarm caused some cotton to be ploughed up, and planted again. The Hessian Fly will cause much greater damage than has ever been previously suffered by our own wheat, though it was sowed within the time which usually insures safety. Other neighboring fields suffer as much, and will not yield the half of average crops: but it is said that others within ten miles, are but little affected. Thus it is, that a single reporter, confined to his own farm, or even his own neighborhood, might serve to spread error, more than correct information on such subjects, though many reporters would fully serve the purpose desired, and be of great service to the whole agricultural community.]

CHEAP EDITION OF THE FARMERS' REGISTER.

The only objection which has been made to the Farmers' Register is its price—and this is the principal obstacle to its circulation being extended very far beyond its present limits. It would not be difficult to show that the dearness of this work is alleged without good ground, and by a very unfair mode of comparison with low priced newspapers, in which mere bulk is considered, without regard to the nature of the contents, or the execution of the work. The appearance of a paper that is usually thrown aside as soon as it has been looked over, is not judged severely by its subscribers; and if it is so printed as to be both legible and intelligible, most readers are content. But a periodical

publication in the style in which the Farmers' Register appears, requires far more care and expense; and it is presumed that not many of its subscribers would be willing that it should lose its rank in this respect, even though accompanied by a reduction of price.

There is another reason, and a very important one, why most papers, and even most agricultural papers, may be furnished at lower prices, in proportion to the amount of matter printed, than the Farmers' Register. The latter derives no profit from advertisements entering the body of the work—and these furnish a considerable part, and generally much the greatest part of the profit of the paper that admits them. It is for our readers to compare this publication with others as to the quality and value of the matter furnished. Considering merely size and beauty, and correctness of execution, taken together, this is the cheapest periodical that has yet appeared in the southern states.

But though justice requires that we should thus meet the objection to the alleged high price of the Farmers' Register, we know that the most conclusive arguments on this head will not avail much in extending its circulation. To effect this object, it is necessary to furnish a publication which shall be *cheap in every sense*—and therefore it is intended to offer one which may be compared with most others, as to price, by measure and bulk, without losing any thing in correctness, or in any other respect than external appearance. This experiment will be made forthwith—and it will be for the farming community to decide whether it shall be supported or not.

In addition to the present monthly publication, the Farmers' Register will be issued in a single sheet of 16 pages, four times a month. By using paper of inferior quality, and saving the expense now incurred for pressing, folding, and stitching and covering the sheets, and of the guarantee of the safe passage of the copies by mail, the price may be reduced to the following rates—at which the *Cheap Edition* will be furnished, commencing with this sheet.

For one copy, or 48 sheets in 12 months,	$3 00
For 4 copies, subscribed and paid for in advance at one time, $10, or for each, - -	2 50
To any person who is already a subscriber to the monthly Farmers' Register, the price of a single copy of the cheap edition will be, -	2 50
And 5 subscribers to the monthly Farmers' Register, may, by subscribing at once, for the cheap edition, receive their copies for $10, or for each, per annum, - - - - -	2 00

The price of the cheap edition, in every case, must be paid in advance.

The cheap edition will be commenced regularly as soon as the names of 500 subscribers are returned. As but few copies will be struck off more than for actual subscribers, the year of subscription will generally be commenced with the last published number: but if desired by the subscriber, he will be supplied with back numbers, as long as they can be furnished. The matter contained in every sheet will be precisely the same with that of the monthly Farmers' Register.

It is presumed that the low price at which it is offered to existing subscribers, will induce many to take the cheap edition, if for no other reason than the better preservation of the higher priced copy. To all such, who take the cheap edition, and who may choose to let their higher priced monthly numbers remain with the publisher until the close of the volume, they shall be delivered in neat and strong half binding, (with leather backs and corners,) for an additional sum of 50 cents for each volume—or without any charge for binding, if the cheap edition was obtained at not less than $2 50. These several advantages offered to the subscribers to the monthly publication, it is presumed will be to them a sufficient pecuniary compensation for the facility which their subscriptions afford to the issuing the cheap edition.

It is frankly admitted that it is the liberal aid already afforded by existing subscriptions to the Farmers' Register that enables the proprietor to offer this edition in so cheap a form—and that the future diminution of that aid, should it occur, will put an end to this plan, as soon as all existing engagements have been complied with: unless, indeed, the list of subscribers to the cheap edition should by that time become so extended, as to furnish of itself a source of profit. In that event, the monthly edition may also be reduced in price, though it will necessarily be always higher, for those who desire such paper and press work as will make a handsome volume.

Further—for the purpose of facilitating payments through the mail to those who wish to subscribe for more than one publication, and also as more suitable to the now general state of pecuniary embarrassment, the price of the *Farmer's Library* will be reduced to $2 50, by its first proposed size being diminished in proportion. This change will be stated more particularly in an amended prospectus, which will be on the cover of this number of the Farmers' Register.

The proprietor cannot lose by the publication of the cheap edition for a year, even should it be then discontinued—and by its being made, the public will gain whatever may be the value of the extended diffusion of the information contained in this work.

TO CORREPONDENTS AND SUBSCRIBERS.

The following communications have been received, and will appear in No. 2: "On the diseases of Cattle and Sheep"—"On the cultivation of low grounds"—"On apprenticeships to farming," [continuation of *Pattern Farms.*]

Supplementary sheets containing a list of subscribers, and a general index to Vol. I. will be sent with this number—which though not separately directed, postmasters will please to deliver to the subscribers for Vol. I. who still receive the Farmers' Register at their respective post offices.

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